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# GOLD MINING

AN ECONOMIC STUDY 1955

## in Ontario





**Report of the  
Committee of Inquiry into the Economics  
of the Gold Mining Industry**



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Ontario. Economics of the Gold  
Mining Industry, Committee of  
Inquiry into the, 1955

# **GOLD MINING in Ontario**

report of the  
Committee of Inquiry into the Economics  
of the Gold Mining Industry, 1955

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*Stratford*

1955



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ONTARIO

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Charts by Walter Kopacz



# report

to the Honourable  
Leslie M. Frost, Q.C., LL.D.,  
Prime Minister  
of Ontario

We, the Members of the Committee  
of Inquiry appointed on March 22, 1954,  
to conduct an inquiry and to report  
on the Economics of the Gold Mining  
Industry in Ontario submit the  
following report





## **terms of reference**

The terms of reference given to the Committee were to examine and to report on:

- (a) the conditions affecting the present position of and prospects for the gold mining industry in Ontario;
- (b) the causes underlying trends in employment, wages, working conditions, profits, dividends, etc., in the industry; and
- (c) the effects of these developments on communities in the northern parts of the province.

Legislature of Ontario Debates  
March 22, 1954



## **acknowledgements**

Throughout its study of gold mining in Ontario the Committee has received much help from briefs submitted by, and discussions held with, representatives of management and of labour and of the municipal governments of the areas mainly dependent upon gold mining. The mine staffs are to be especially thanked for their answers to many detailed questions.

The Committee's deliberations have been greatly aided by the research reports made for it by Dr. Bernard Goodman and Mr. S. F. Kaliski. Miss M. G. Arnoldi, Statistician of the Ontario Department of Mines, and other officials of the Ontario Government, the Research Department of the Bank of Canada and the Dominion Bureau of Statistics have all been most co-operative.

Above all, the Committee would express its deep appreciation of the great services of its skilled and indefatigable secretary, Mr. James Johnston, and of his assistant, Miss Audrey Allen.





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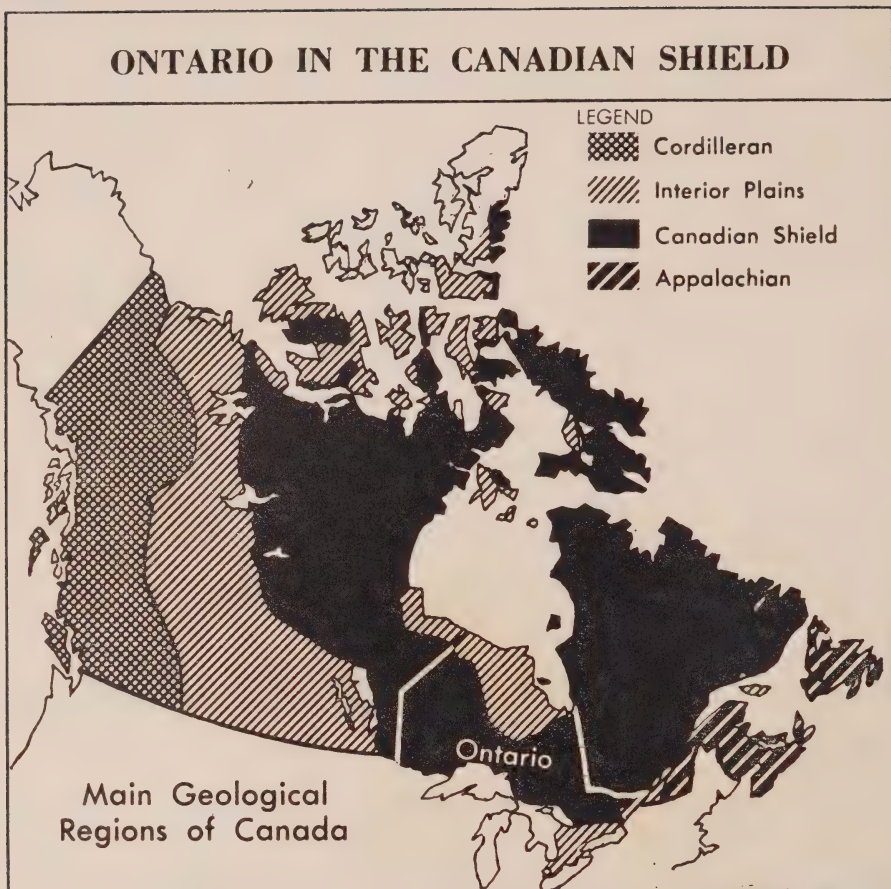


## **gold mining in Ontario**

Few mineral areas in the world are as rich as the Canadian Shield (Chart I). It produces three-quarters of the world's nickel and half of its platinum. At Cobalt its silver mines were the world's richest. Its gold, found principally in Quebec, Ontario and the Northwest Territories, makes Canada the world's second producer. Asbestos, cadmium, cobalt, copper, iron, lead, lithium, magnesium, molybdenum, titanium, zinc — name almost any metal — the Shield has it somewhere and often in abundance. Its uranium ore may make Canada the world's largest source.

Ontario is important as a mining province because it includes a large and accessible part of the Canadian Shield. Nickel output leads in value among Ontario's minerals, but gold is second and accounts for one-quarter of the total. The gold industry now employs 10,500 workers and is the principal support of Ontario communities where 70,000 people live.

CHART I



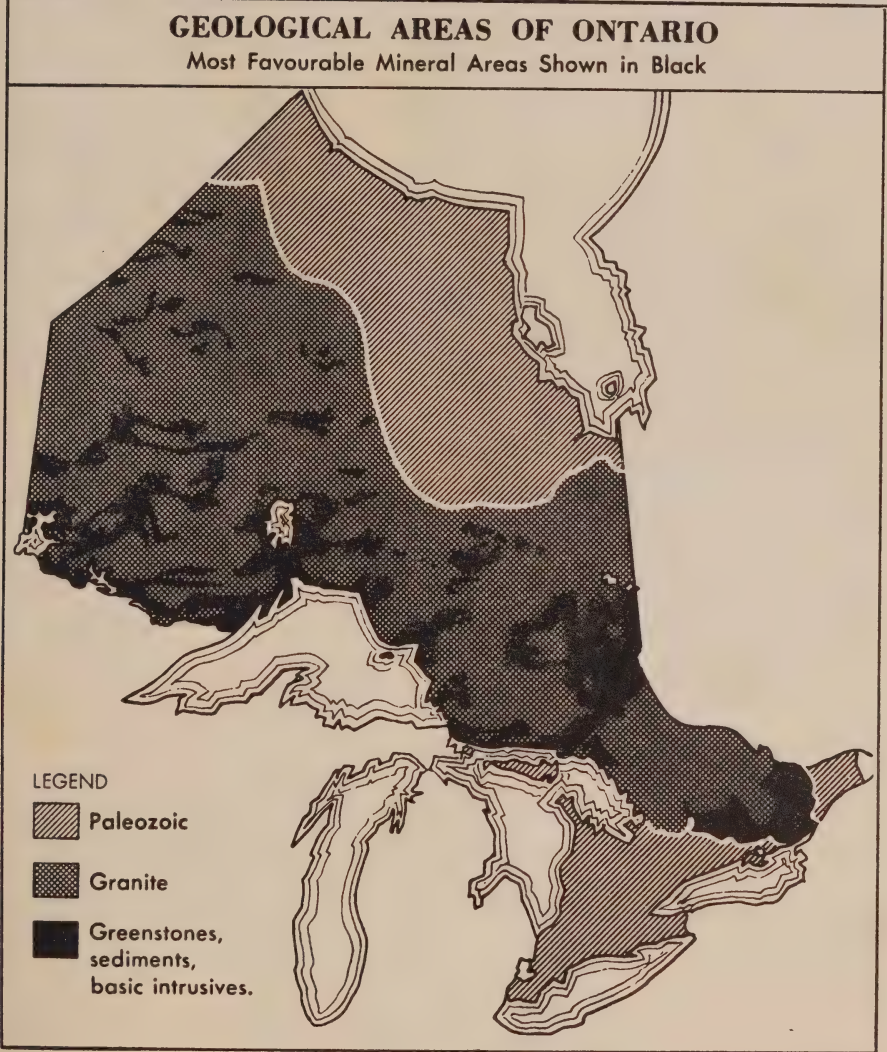
*(after Canada Year Book)*

Geologically, the most favourable areas for gold are the greenstone rocks, the relatively small scattered patches on the geological map (Chart II). They are the remnants of the earth's older crust which for millions of years on the Shield have been surrounded by granite rocks. These greenstone areas have long been known to be the most likely ore bearing areas, and all of Ontario's mines have been found within them.

Today, gold production is scattered in many places across northern Ontario in these areas of Precambrian rock. However, output has always been concentrated on northeastern Ontario where 23 of the province's 33 producers are now situated (Chart III). Though

they are the oldest camps still in production, most of our gold output still comes from the Porcupine and Kirkland Lake regions. It is in these camps, therefore, that the present economic difficulties of gold mining show up most clearly. In the other two large mining areas, Larder Lake and Patricia (Red Lake and Pickle Lake) the newness of many of the mines makes growth still possible.

CHART II



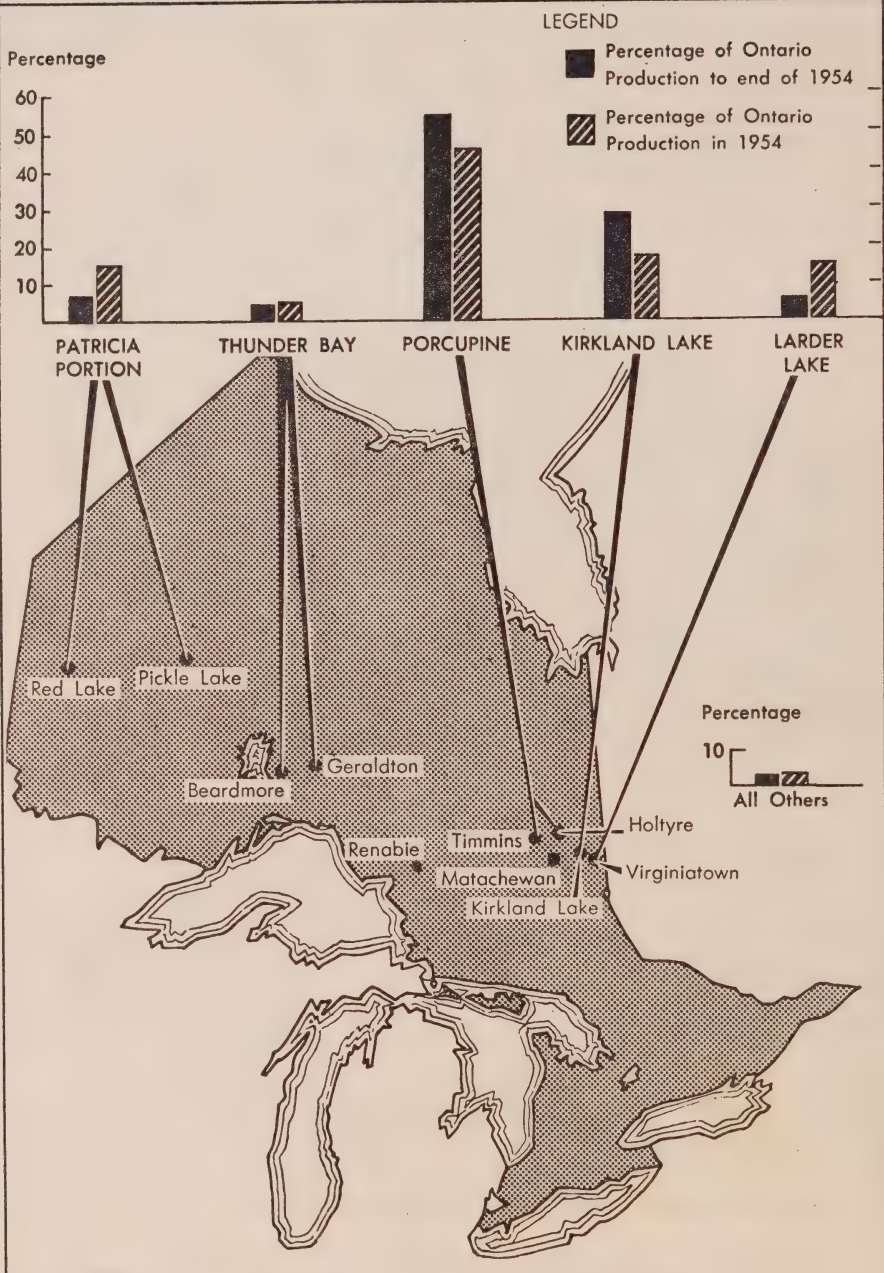
(After J. Ledingham)



CHART III

# ONTARIO GOLD MINING CAMPS

THEIR LOCATIONS AND RELATIVE IMPORTANCE



The province's first gold mine was developed in 1866 in Hastings County in eastern Ontario. Since then, gold has been found in many parts of the province, but large scale production began with the development of the Porcupine. In its first two years, 1912 and 1913, this camp produced more than twice as much gold as had the entire Ontario industry until that time.<sup>1</sup> Kirkland Lake's development came a few years after that of Porcupine. Important camps like Larder Lake, Red Lake, Longlac and others have developed more recently (Chart IVb). Today the Patricia and Larder Lake camps produce as much as does Kirkland Lake though they are still far behind the Porcupine camp (Chart III), both in production to date and in current production.

In the early part of this century Canada's gold mining industry was headed for insignificance as the Klondike's production declined (Chart IVa). The opening of the Porcupine camp after 1910 turned the national trend sharply upward. With the addition of Kirkland Lake in the early 1920's Ontario dominated Canadian gold mining until the early 1930's. Thereafter, mines in other provinces became important and Ontario's relative position has declined. Yet in 1954 Ontario's production of \$79 millions was still 54% of a declining national total. Last year's output was equalled or exceeded in only 12 years out of the past 45. However, these large figures must be viewed against the industry's general decline. During 1955 one gold producing mine in the province will exhaust its ore reserves. Two more are on salvage operations. Others are not developing new ore reserves as rapidly as they once were. Some maintain their present production only because of assistance by the Federal Government.

Since 1930, two factors — the great rise in the price of gold in 1934, and the Second World War and its aftermath — have been mainly responsible for the spectacular trends in production. The fixing of the United States buying price of gold at \$35.00 an ounce in January, 1934 — a rise of 69.3% from the previous price of \$20.67 — made it possible to mine ore of much lower grade. Old mines gradually began to lower the average grade of ore mined; large low grade ore bodies that had long been known became economical

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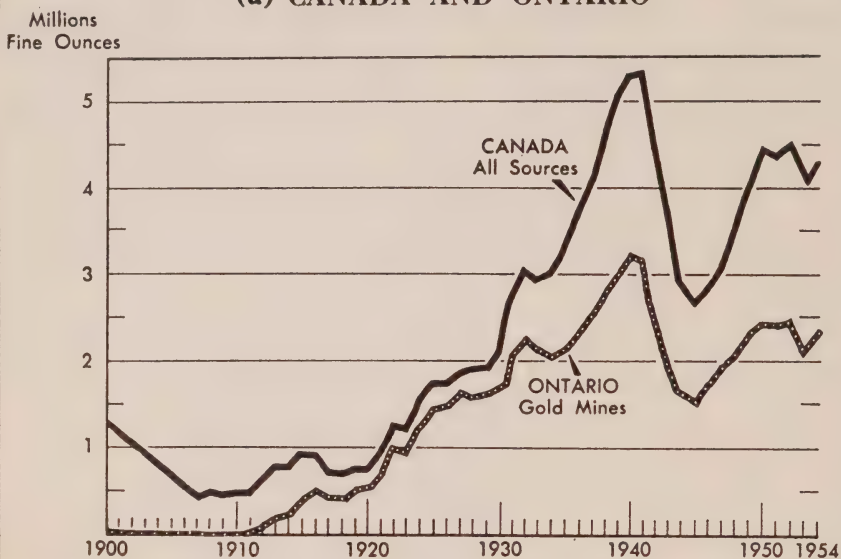
(1) Southeastern Ontario, Lake of the Woods and Rainy River areas.



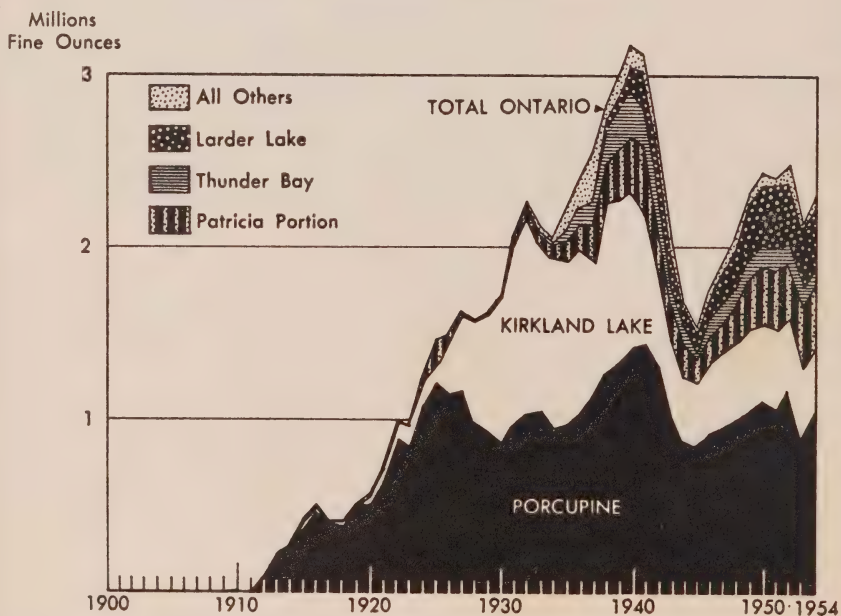
CHART IV

## GOLD PRODUCTION, 1900-1954

### (a) CANADA AND ONTARIO



### (b) ONTARIO, BY CAMPS



to mine, and prospecting for others was greatly stimulated. The depression kept the prices and wage rates from rising, thus accentuating the effect of the gold price increase.

The impact of the gold price increase and the depression changed the stature of the gold mining industry in Ontario remarkably (Chart V). Old mines and old camps expanded; new mines and new camps developed. In 1933 there were 20-odd producers; by 1940 there were more than 60. In the Porcupine there was a second round of development of new mines, most of which are still in production. In Kirkland Lake the adjustment came mainly through the lowering of grades at existing mines. Scattered across northern Ontario, many newer mining areas developed into importance, such as Red Lake, Pickle Lake, Longlac, Larder Lake and Matachewan. Sixty-seven gold mines have come into production since the price of gold was raised. Few of them could ever have produced at a profit if gold had remained at \$20.67 per ounce. Many of them were not successful even with gold at \$35.00 an ounce and were short-lived. But the importance of the higher gold price in determining the size of Ontario's gold mining industry is shown by the fact that 23 of today's 33 producers came into production after the gold price rose.<sup>1</sup> Only ten mines are still in production from the earlier period.<sup>2</sup>

A second but less important spurt in both national and provincial production was the result of the need for United States dollars in the early years of World War II. War production was bound to demand more and more imports from American suppliers. To increase gold production was an obvious way to expand exports.<sup>3</sup> In the December 1940 budget the Hon. J. L. Ilsley, Minister of Finance, called it a "patriotic obligation" for the gold mines to increase production "by every means known to the able and experienced operators of that industry." A few months later, in April 1941, the pressure to earn American dollars was eased by the Hyde Park agreement and the production of gold became less important to the war effort. By

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(1) Of the 33 producers in 1954, one, Bonwhit, has since surrendered its charter and has been absorbed into Broulan Reef.

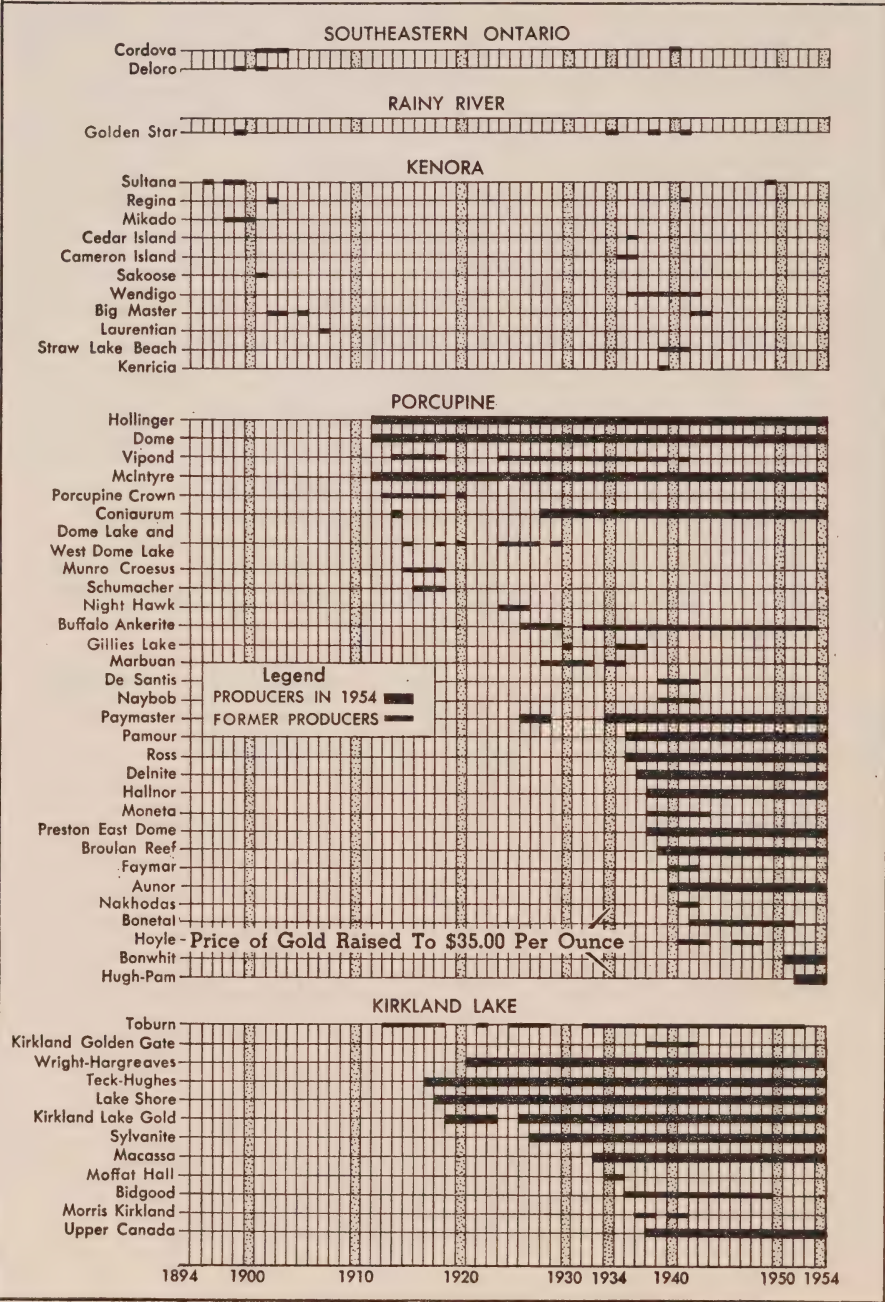
(2) This experience of the 1934 gold price increase suggests what might happen if the price of gold were raised substantially again. In replies to this Committee, several mines indicated that they have lower grade prospects which a higher price for gold would make profitable. See Appendix I.

(3) See Appendix II.

CHART V

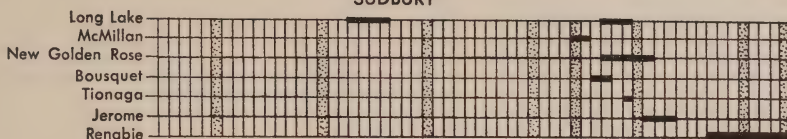
# ONTARIO GOLD MINES YEARS IN PRODUCTION, 1894-1954

With Production exceeding \$50,000 in years shown.

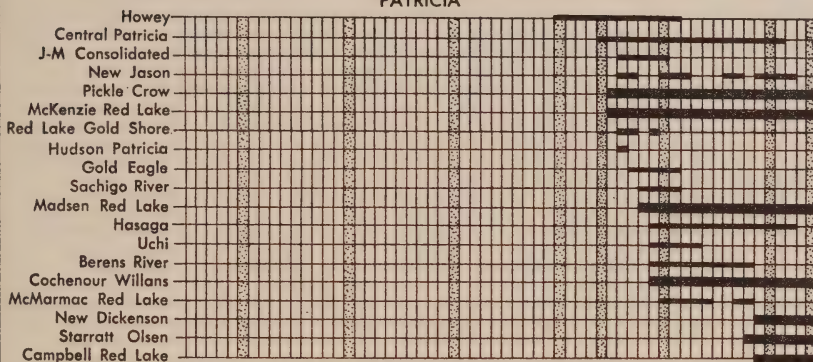




### SUDBURY



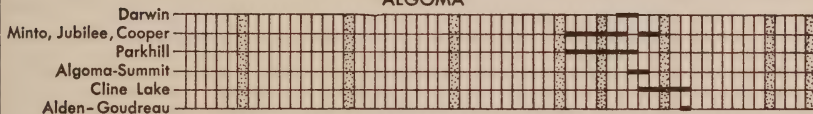
### PATRICIA



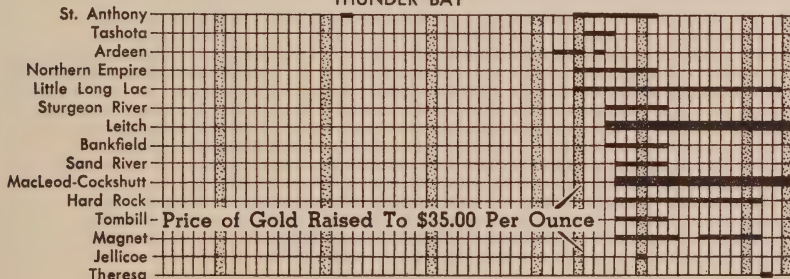
### MATACHEWAN



### ALGOMA



### THUNDER BAY



Price of Gold Raised To \$35.00 Per Ounce

### LARDER LAKE



1894 1900 1910 1920 1930 1934 1940 1950 1954

October 1942, gold mining was classed as a non-war industry and thereafter received no priority for labour and supplies.

From the 1940 peak of \$122.6 millions, production therefore dropped to \$59.5 millions by 1945 — a 51.5% reduction in ounces produced. Profits and dividends declined; some mines closed; no new ones opened from 1943 to 1946. With labour shortages, development work was cut down and so ore reserves were greatly reduced. Meantime, mining costs were raised by the wartime increase in prices and wages. The increase in the Canadian dollar price of gold, because of the 10% depreciation of the Canadian dollar which was permitted in September 1939, afforded some offset against this rise in costs. As this price (\$38.50) was stable for a time, the continued rise of prices and wages in the mines as the war went on tended to put the industry in a “squeeze” between a stable price for gold and the rising costs of mining it.

Despite this cost-price situation, the gold industry looked promising at the end of the war. The Canadian dollar was still at a discount of 10% and the Canadian price for gold accordingly at \$38.50 per ounce. World free market prices for gold were high; \$52.06 per ounce was quoted in Hong Kong in 1947. Many Canadians expected a postwar depression, and experience seemed to show that a depression would mean prosperity for the gold mines. Before the postwar expansion in manufacturing and the resources boom touched off by the discovery of oil at Leduc in 1947, few industries looked as promising as gold, and money for investment in its production was plentiful. Gold stocks tripled on The Toronto Stock Exchange from a wartime low of 50.16 in October 1942 to a postwar high of 147.31 in February 1946.<sup>1</sup> In 1943 only two gold mining companies reported development work at non-producing properties; in 1945, 159 companies reported such work. The annual capital investment in mines and mills reached, in 1948, a postwar peak of \$5.6 millions, a figure surpassed only in the boom of the late 1930's and early 1940's. This activity brought about a maximum postwar gold production of \$93 millions in 1950.<sup>2</sup> The sequence of favourable stock market opinion,

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(1) 20 gold stocks, mean second half of 1933 equals 100.

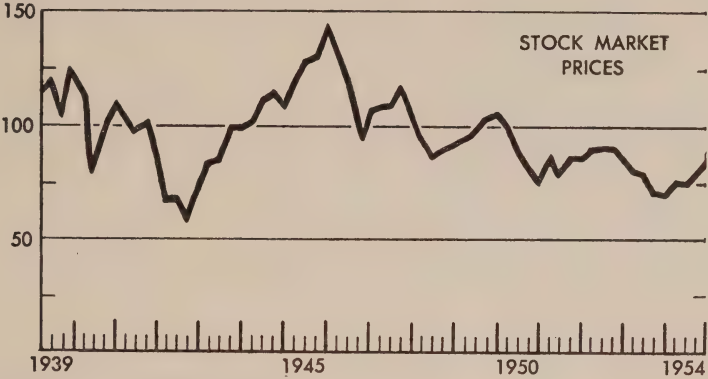
(2) Only five years in Ontario surpassed this record: 1938—\$99.4 millions; 1939—\$109 millions; 1940—\$122.6 millions; 1941—\$120.6 millions; 1942—\$104.2 millions. See Appendix III.



CHART VI

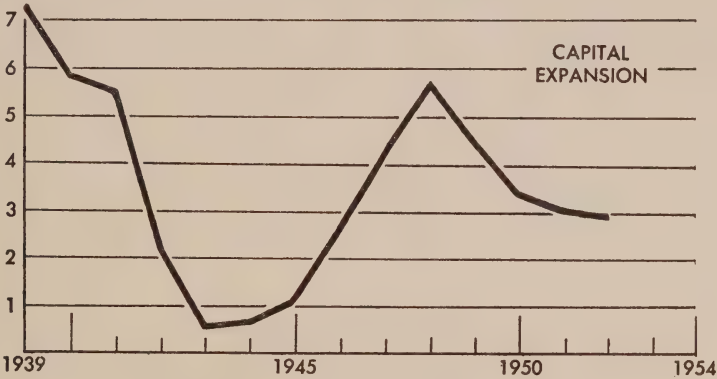
ONTARIO GOLD MINES  
WAR AND POSTWAR TRENDS, 1939-1954

Toronto Stock Exchange Index \*

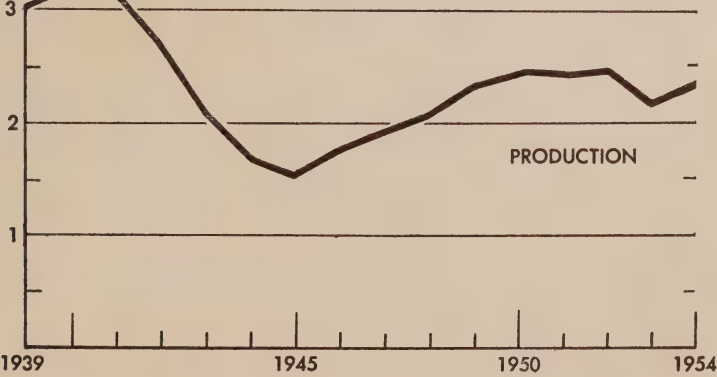


\* Mean second half 1933 equals 100.

\$ Millions



Millions  
Fine  
Ounces



the increase in gold mining investment and the consequent increase in production is made clear by Chart VI.

## **The Financial Returns from Gold Mining**

It is probable that more has been spent trying to find and develop gold mines in Ontario than shareholders have had in dividends from producers. No one will deny that, by any measure, a few mines have been very profitable. But, for each success, there have been many failures. About 4,000 companies have been incorporated in Ontario to mine gold; 200 of them have produced gold; only 73 have made enough profit to pay mining tax; 51 have paid dividends; possibly 35 have paid as much in dividends as has been spent to bring them into production.<sup>1</sup> In spite of this record, men searched for gold, spurred on by the hope of finding one of these rare "prizes." The lure has been so great that one mining executive told this Committee that his company was satisfied if for all of its searchings it found, or was associated with the finding of, one new mine in every 12 years.

Profits and dividends today are smaller and harder to earn. Profits before taxes have fallen from a 1940 peak of \$50 millions to \$15 millions in 1953. During the same period operating profits fell from 40% to 20% of the value of production by 1953, and were 27% in 1954. In 1954, profits before taxes amounted to an estimated \$21 million.

Dividends in the 1930's were high, rising to 39.9% of the total value of production in 1937; they never fell below the 30.2% recorded in 1933. Since 1940 the highest ratio of dividends to production was 19.2% in 1953 and the lowest 17.3% in 1951. In the same year (1953) profits and dividends each stood at \$15 millions (Chart VII).

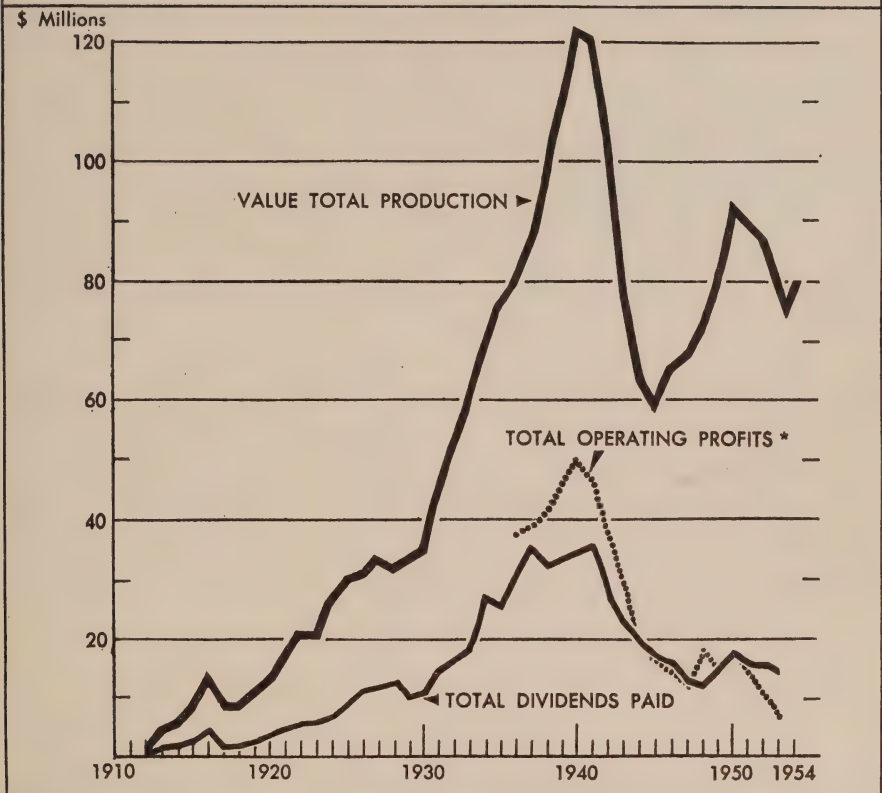
This maintenance of dividends in the face of declining profits is explained by the growing importance of non-operating or investment income. In many cases established mining companies have become holding or investment companies with a wide diversity of

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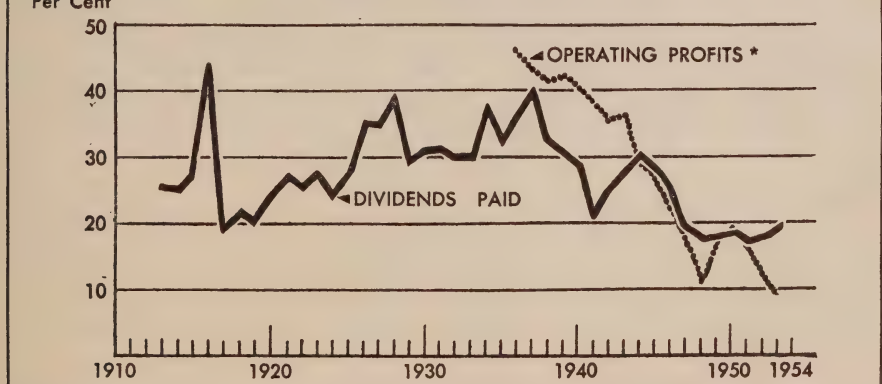
(1) See Appendix IV. Only one of the 33 present producers in Ontario with its own mill has invested less than \$1 million in plant and equipment, excluding property. Thirteen are in the \$1 million-\$2 million class. Four are over \$5 millions.

CHART VII

ONTARIO GOLD MINES  
**PRODUCTION, PROFITS AND DIVIDENDS, 1912-1954**



**OPERATING PROFITS AND DIVIDENDS AS PERCENTAGES OF PRODUCTION VALUE**



\* Before taxes and excluding EGMA.

interests. A few of them have substantial industrial investments. Non-operating income amounted to about \$5 millions in 1954, or one-quarter the amount of actual gold mining profits in Ontario. Though most of the income goes to a small group of older mining companies, some of the younger mines are now developing substantial outside interests also. Only a small part of these earnings comes from subsidiary gold mining companies that might share the fate of the parent. Although seven of the province's producers in 1954 were controlled or operated by other Ontario gold mines, many companies have interests far removed from gold. They may have large investment portfolios or they may share in mining ventures in iron ore, uranium, base metals, or oil. Some of these ventures already indicate success.

The movement of capital out of gold mining continues. Information from the mines shows that since 1950 present producers have spent very little on exploring for gold, though many companies have extensive exploration programs underway for other metals.<sup>1</sup> Some companies suggested that an increase in the price of gold might be more important by giving them the funds to expand this non-gold exploration than it would be in inducing them to look for more gold.

The fall of the stock market values of gold mining shares to their market lows since 1946 is a most remarkable reversal of expectations. The great variety and attractiveness of investment opportunities in other industries was bound to draw some capital from gold mining; but the practical desertion of the industry by investors suggests that even the owners have small hopes of gaining in gold mining, the rate of return on capital now thought possible in alternative investments. Why this reversal of prospects has come about, what its effects may be both on employment and wages in the mines and on the prosperity of the mining communities, and what social policy should be in this situation are the subjects of this report.

(1) See Appendix V.



## **the cost-price squeeze**

### **Introduction**

The history of gold mining shows a remarkable contrast between the dramatic and sudden "gold rush" with which camps begin and the slow, unspectacular process by which they come to an end. Mines in the full tide of production do not close down without warning. As they get older, deeper and larger, and as ore bodies are worked out, costs rise, profits diminish and production and employment shrink. Even when the end of a mine is in sight, some years of production and employment may be ahead after it has been put on a "salvage" basis. The spectacular onrush of development ends in the slow process of retreat.

The abrupt reversal of fortunes experienced in gold mining in Ontario in recent years did not arise, however, from this slow process of exhaustion. Factors external to the gold mining industry were mainly responsible. The spread between the price of gold and the



costs of mining it has been narrowed much more quickly than usually occurs in the physical process of exhausting the mines. In the last two decades indeed the slow worsening of the prospects of mines as they get older has been quite overshadowed by two dramatic developments outside the business of mining. First, as an anti-depression measure President Roosevelt raised the price of gold in 1933-34 to \$35.00 an ounce from the \$20.67 an ounce which had obtained for a century or more. Second, this country has experienced a drastic inflation since the beginning of World War II. Gold mining has therefore been subjected to an unprecedented piece of good luck of magnificent proportions, and then forced to contend with one of the worst situations an industry can face, namely a rapid rise in costs against a stable or declining price.

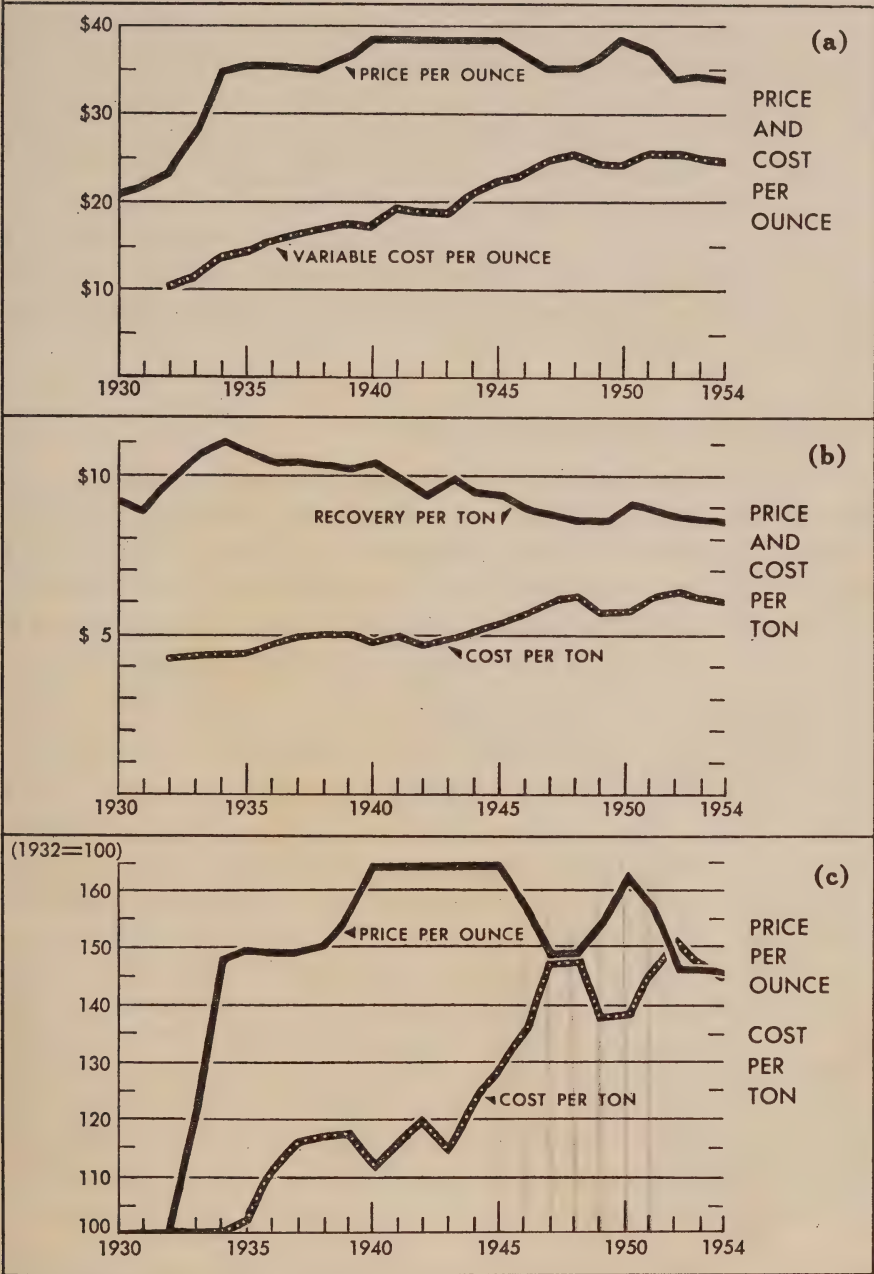
It is sometimes argued that the combination of these two events leaves the gold producer better off than he was before 1934; that costs even yet have not caught up with the rise in price made then. This contention is open to serious doubt. The great spread between stable costs and the new 1934 gold price made it possible to develop many mines which could not have been operated profitably before. Mostly they were prospects with large low-grade bodies of ore; a few proved to be high-grade mines, some of which had high costs. For all these new mines, the war and postwar rise in costs has obviously whittled away most of the profit possibilities which brought them into existence. Other mines, possessing ore of a wide range of grades, were stimulated by the rise in the price of gold to enlarge their operations to include lower grades of ore not previously profitable. In recent years rising costs have reduced or eliminated the profit from mining these lower grades of ore. Usually the mines cannot return to the former smaller-scale, higher-grade operations as carried on before 1934. The expansionary process cannot easily be reversed.<sup>1</sup> It is true that to mine only the higher grades increases the revenues per ton of ore mined. Unfortunately, however, it reduces the number of tons which can be mined. If the high grade of ore were all in one part of the mine, variable costs of mining might not rise much. As this is rare, however, much labour must be spent on keeping most of the mine operating. Production per man will also fall as trams,

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(1) See Appendices I and VI.

CHART VIII

ONTARIO GOLD MINES  
CHANGES IN THE PRICE AND PRODUCTION COSTS  
OF GOLD, 1930-1954 : THREE MEASURES



crushers and other machines handle less ore than the amount for which they were designed. The possibility of offsetting great increases in variable costs by raising the grade of ore mined is therefore limited.

It is the argument of this report that the current difficulties of the gold mining industry have their origin mainly outside the industry; that Ontario gold mines were induced by the good fortune of the rise in the price of gold so to expand as to make them particularly vulnerable to the great postwar inflation. The gold mining towns at the same time became large communities not so easily abandoned as smaller camps are. Price and cost trends have put the gold mines and these communities in a difficult position which mining companies, labour unions and governments alike must take into account in determining their policies.

## Measuring the Cost-Price Squeeze

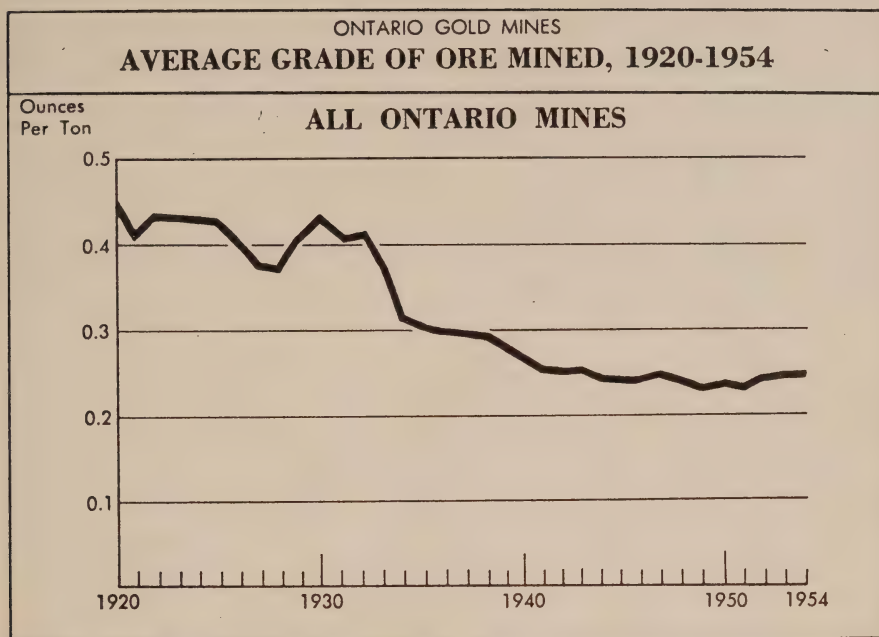
Profits depend on the spread between the price of gold and the costs of its production. Prices and costs in gold mining are commonly measured on either of two bases, per ounce or per ton. In Chart VIIIa prices and costs are expressed per ounce of gold recovered; in VIIIb they are stated per ton of ore mined. To obtain the four measures of prices and costs used in these charts, three sorts of information are required: the price of gold per ounce, the costs of mining per ton of ore, and the average grade of the ore mined. Revenue per ton (or recovery as it is frequently called) is the price per ounce multiplied by the grade (usually a fraction of an ounce of gold per ton). In a similar fashion, costs per ounce are the costs per ton divided by the grade. Therefore, of the four measures used in Chart VIII, two (price per ounce and costs per ton) are fundamental or independent variables (Chart VIIIc) and the other two, revenue per ton and costs per ounce, are derived or dependent variables. They are functions of the grade and the respective independent variables.<sup>1</sup> In an explanation of the trend of mining profits this classification is essential. Most elements of the two basic factors are beyond the control of the mine manager; the grade, and thus the revenue per ton and the cost per ounce, are to some degree under his control. Governments set the price of gold.

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(1) Revenue per ton = price per ounce  $\times$  grade. Cost per ounce = cost per ton  $\div$  grade.



CHART IXa



Sources: Pages 108-109.

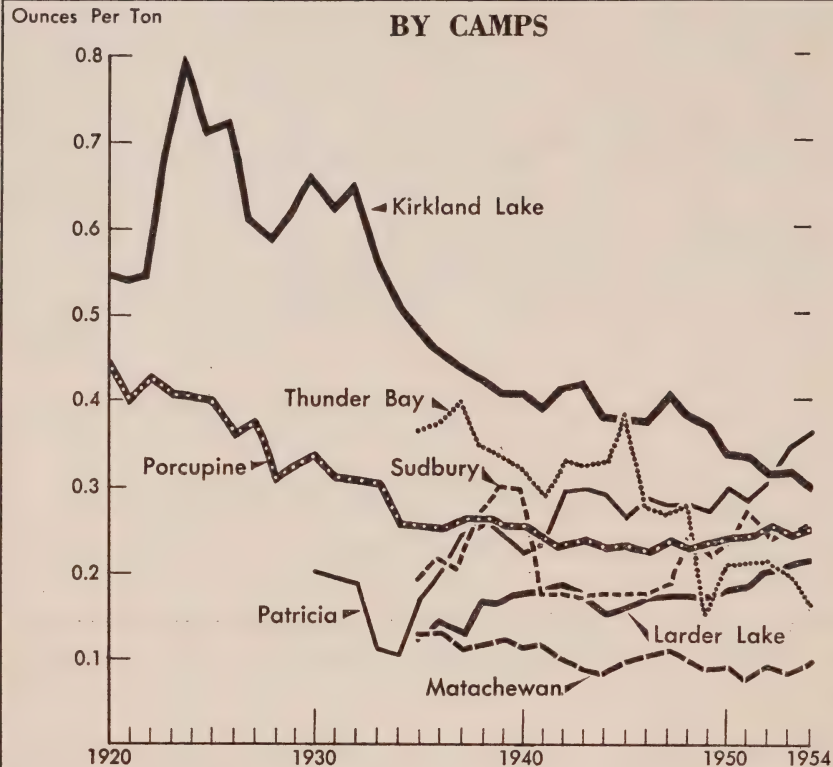
Changes in mining costs reflect mainly the trends of wages and materials prices. The grade of ore to be mined, on the other hand, is a management decision.

The great changes in the last three decades in the average grade of ore mined in Ontario are shown in Chart IXa. The large increases in grade made in the late 1920's were due to the opening and expansion of several high grade mines (Chart IXb). The decline in grade mined in the 1930's was mainly a response to the rise in the price of gold in 1934. This decline in grade also reflected a natural trend as the richer veins of the Porcupine and Kirkland Lake camps were mined out. The failure of the average grade mined to rise much since 1940 despite the great inflation of mining costs shows clearly the probable unprofitability of such action for most producing mines. Thus even grade changes largely reflect factors external to the industry.

When the grade of ore is stable as in recent years the cost-price squeeze may be measured by any of the methods of Chart VIII. When the grade changes, however, only the method of Chart VIIIc is valid.

CHART IXb

ONTARIO GOLD MINES  
AVERAGE GRADE OF ORE MINED, 1920-1954



Sources: Pages 108-109.

To measure trends in prices in such periods by changes in revenue per ton (price per ounce multiplied by ounces recovered per ton) or changes in costs per ounce (cost per ton divided by ounces recovered per ton) would be confusing. The margin between sales revenue and cost of mining would change not only because the basic factors (price of gold and costs of mining) had changed but also because the grade of ore mined had changed. The cost of mining thus might be shown to have changed considerably when in fact the cost of labour and materials had altered little. In Chart VIIIa, for instance, the benefits of the great rise of the price of gold per ounce in 1934 are shown to have been considerably diminished during the late 1930's by a rise



in the cost of mining per ounce. In fact, the costs of mining per ton then rose relatively little; the rise in the cost of mining per ounce is mainly due to the fall in the grade of ore mined. The fall in grade is also responsible for the seeming fall in sales revenue from gold in the same years. In fact, there was no fall in the Canadian dollar price of gold until the year 1946, (Chart VIIIc). Obviously changes in the revenue per ton or the cost per ounce are not useful measures of those changes in the cost-price situation in mining which arise from the external or market factors. To exclude the effect of grade changes on mining costs and revenues, these must be expressed as costs per ton and price per ounce.

A direct comparison of the price of gold per ounce and the actual dollar costs of mining a ton of ore at any one time will not show whether mining is profitable. But a comparison of the movements of these two factors between any two points of time does reveal whether the market forces themselves are making mining more or less profitable. In Chart VIIIc the movement of the price of gold per ounce and of the variable costs of mining a ton of ore are expressed as a percentage of their values in 1932 to make easier the comparison of their relative movements since that time. So far as market forces alone determined it, mining in the 1930's was clearly becoming a much more profitable operation. Just as clearly the relative rise in mining costs since the early 1940's shows these forces to have worked to reduce drastically the relative profitability of mining. It must be repeated that from such calculations nothing definite can be said as to the profitability of mining; all that the chart shows is that the trends of the price of gold per ounce and of variable costs of mining first increased that profitability and then reduced it. In the 1930's the cost-price situation was vastly improved; since the 1940's there has been a growing "cost-price squeeze."

The actual behaviour of mining profits (Chart VII) strikingly reflects the fluctuations in the cost-price situation as these are measured in Chart VIIIc. From the early 1930's till 1942 the value of gold produced and the profits of gold mining rose spectacularly. As a percentage of the value of production, profits reached a maximum about the same time. Until the early 1940's the great increase in the price of gold and the slight rise of variable costs (Chart VIIIc)

continued to stimulate gold production and expand profits. The internal forces which tend to raise costs as mines get older were too weak and too slow in their operation much to affect these trends. The method of measuring trends in the cost-price situation used in Chart VIIIc most clearly suggests the true explanation of the behaviour of production and profits since 1932. The next two sections examine the reasons for these trends in the Canadian price of gold and the costs of mining it, as well as for attending mainly to the variable or out-of-pocket costs of mining rather than the total costs.

### **Trends in the Price of Gold in Canada**

The price of gold which any Canadian gold mine now receives depends upon the United States price of gold and the value of the Canadian dollar on the markets for foreign exchange<sup>1</sup> (Chart X). Today all mines sell their gold to the Government of Canada. For brief periods since the end of the Second World War some mines sold their gold in other countries when prices were higher there than at the Mint. In estimating the future of the price of gold three factors must therefore be considered: the Washington price, the chance that the hoarding demand for gold might occasionally raise its price beyond that paid by the United States Government, and finally the rate of exchange between the United States and the Canadian dollar.

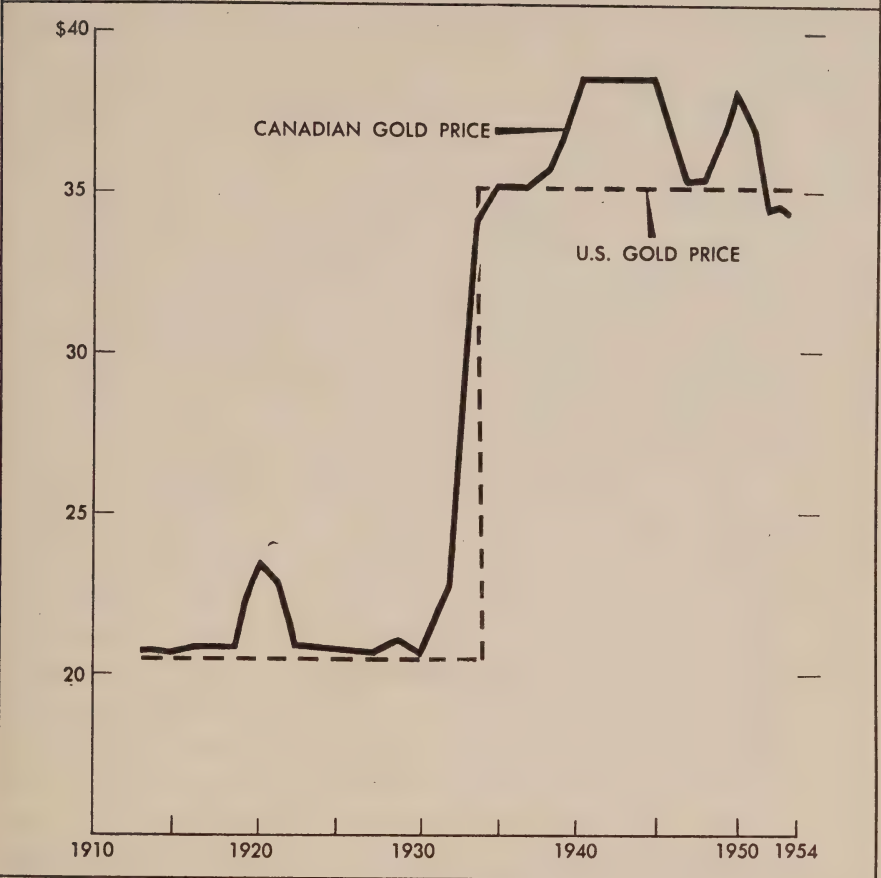
The price of gold is due to the monetary demand for it; the industrial demand for gold would not of itself support any such price. Although all countries on the gold standard were obligated to buy and sell gold at a fixed price without restraint, yet the actual price of gold during the 19th century was set in trading between bullion dealers in London. The narrow range within which the price varied was determined by the price at which the Bank of England was ready to buy and to sell gold in any amounts offered or demanded. The sterling price of gold in the markets of other countries might go higher or lower than the London price by the cost of transporting gold between London and foreign markets. The price of gold in local currencies would be the sterling price in the local market converted into the domestic currency at the prevailing rate of exchange.

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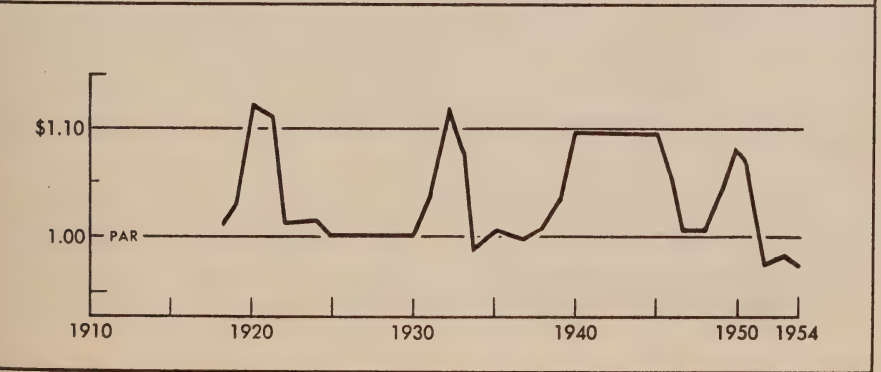
(1) The effect of the Emergency Gold Mining Assistance Act is to give a different price per ounce to every mine. See Appendix VII.

CHART X

PRICE OF GOLD IN CANADA AND THE RATE OF EXCHANGE, 1910-1954



VALUE OF UNITED STATES DOLLAR IN CANADA





Such a world gold-price-fixing scheme as was the 19th century gold standard could only be maintained if some economically powerful country stood ready not only to support the price of gold for its own gold producers but also for those of any other country in the world. In the 19th century Great Britain undertook this obligation; it is today assumed by the United States. The world price of gold is therefore now set in Washington.

Canadian gold producers are vitally concerned with the answers to two questions about this peculiar situation: will it continue, and will the United States Government raise the price of gold? In the discussions about the gold problem which have taken place in the United States the assumption has been universally made that their government would continue its present gold buying policies. In considering whether the United States Government is likely to raise the price at which it buys gold it should be remembered that the gold standard is a gold-price-fixing system and that the only change in the price of gold which has been made in the last century and a half was that made by President Roosevelt in 1933-34 when the United States had for the time being abandoned the gold standard. He hoped that by raising the price of gold a rise in the price of other commodities might be brought about also, thus easing the severity of the price deflation. It is conceivable that in circumstances as serious as those of 1933 such a manoeuvre might once more be tried by an harassed United States Government. To hope for a rise in the price of gold in a period of prosperity is quite another matter. Current proposals for such an increase rest upon complicated arguments as to the effects it might have on the functioning of the world's monetary and trading system. Monetary experts differ sharply as to the need for such a change, most United States specialists being doubtful as to its expediency. Although the continued purchase of gold by the United States Government at the present price can be relied on, it would be most unwise to count upon an early rise in the Washington price of gold.

It is sometimes argued that were the gold markets of the world freed from restrictions the price of gold would rise much above the Washington price in response to a hoarding demand. It is hard to see why hoarders would be willing to pay more for gold than the



United States price plus the cost of moving it from that country. The price in the local currency would of course vary with the price of United States dollars on the local foreign exchange market. Even when exchange or other restrictions narrow the local market for gold the hoarding demand still depends upon the hoarder's belief that gold will keep its value over the years. The hoarders of the Orient have tested the validity of this assumption from time to time by selling considerable quantities of gold. Had government buying not supported the price of gold on such occasions there is little doubt that the price would have fallen considerably. A few such experiences would much reduce the desire of people to hoard gold as a store of value. In other words, the hoarding demand for gold is dependent upon the willingness of some government to buy and to sell gold freely at a fixed price. Apart from such a world gold-price-fixing system as the United States Government now maintains it would provide a very precarious basis indeed for a high value for gold.

In the near future, therefore, the price of gold in Canada will depend upon the Washington price and the rate of exchange between the United States and the Canadian dollars. Even moderate changes in that rate of exchange have, indeed, important effects upon the value of Canada's gold production and the profits made in gold mining. For instance, a decline of one cent in the Canadian dollar would increase the Canadian price of gold by 35 cents per ounce. This would have meant \$785,285 additional revenue for Ontario's production of 2,308,151 ounces in 1954.

The price squeeze of recent years results not only from the rise in the cost of mining but also from the downward trend in the price of gold per ounce in Canada because of the upward movement in the exchange value of the Canadian dollar. Since the end of the First World War the relation between the value of the Canadian and the United States dollars has been stabilized by action of the Canadian Government for only two periods. During the years 1926-28 the restored gold standard kept fluctuations in the price of New York funds in Canada within the gold points. Between 1939 and 1950 the relationship was again stabilized through the operation of a Canadian exchange stabilization fund, but the price itself was altered in 1939, in 1946 and in 1949 before the system was finally given

up by the government in October 1950. From this long record of exchange instability as well as the present intention of the Canadian government not to interfere with the determination of the exchange rate by the free market, it seems probable that fluctuations in the rate of exchange will continue to have important effects on the Canadian dollar price of gold.

The downward trend in this price since 1949 has been due to the rise of the Canadian dollar, first to par with, and then to a premium in terms of the United States dollar. The heavy inflow of United States capital for investment in Canada has been a prime factor in the appearance of a discount on the United States dollar in Canadian exchange markets. It would be idle to speculate how long it will continue. Though the record gives some support to the view that the normal value of the Canadian dollar is at or below par with the United States dollar it would be hasty to conclude today that the inflow of capital from the United States will soon subside. It is not at all certain that any early easing of the current cost-price squeeze will come from this quarter.

### **Trends in the Variable Costs of Mining**

Capital will not be put in any enterprise unless the prospects are that the excess of revenue over current variable or operating costs is likely to be large enough to return to the intending investor the capital he would invest in it and as large a profit as alternative investments promise. In most industries depreciation of plant and equipment is so adjusted annually as to cover that part of the capital invested in the business which is consumed during the process of production. Investment in land is usually a small part of the total and its value is not used up in production. In gold mining, on the contrary, much of the actual investment may be made in the acquisition of the mining property rather than in the purchase of the machinery and equipment needed. This property is moreover a wasting asset; it is consumed in the process of production. To return the capital invested current revenues must therefore not only be large enough to cover variable costs of operating and the depreciation of plant and equipment; they should also cover such fraction of the

capital invested in the mining property as is deemed to have been consumed in the year's production. Before an investor will put his money into a gold mine the prospects of an excess of revenue over current variable or operating costs must be great enough to cover the depreciation of plant and equipment, to return to the owner some part of the invested capital because of the depletion of his property in production, and to provide the going rate of profit for such investments as well. Only on such an estimate will the original investment be made.

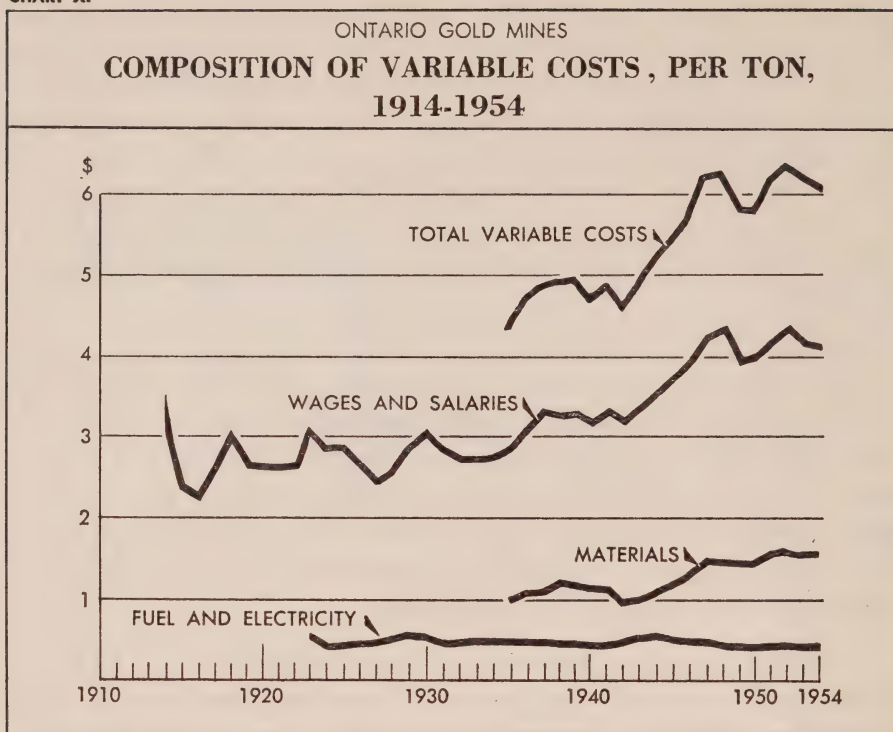
Once the investment has actually been made and the mine put in operation there is no guarantee, however, that any of these allowances above variable costs will be covered by operating revenues. If variable costs were not covered, the mine would be closed down to bring the losses to an end. But no mine will be closed down as long as there is an appreciable excess of current revenues over costs of operating. In that case the owner is receiving something toward the return of his capital and the profit he anticipated.

The frequent argument that if the existing mines are to go on operating the excess of revenues over operating costs must be large enough to return the invested capital and a reasonable profit is therefore not valid. Nor is it true that even if such a level of returns were being received it would ensure the exploration and development required to maintain the current levels of gold mining in Ontario, even assuming the necessary new ore bodies were there to be found. For gold mining in this province is suffering not only from a considerable shrinkage in the excess of revenues over current operating costs but also from more attractive investment opportunities elsewhere. In such circumstances there is no guarantee that money received from gold mining would be put into further development of the industry. Even high profits might, in fact, not be sufficient attraction to bring that about if still greater rewards were in prospect in other forms of mining or other types of industry.

If gold mining were to become highly profitable once more, this in itself, in the present circumstances, would probably not be enough, therefore, to revive the interest in the exploration and development on which the long-run survival of the industry depends. By contrast,



CHART XI



Source: Page 111.

it is not necessary to make gold mining profitable just to keep existing mines operating long enough for all of the communities which depend on them to make adjustments to the prospect of eventual decline. A small level of returns over operating costs will induce the owners of existing mines to keep them going. In the interests of the mining communities it is the early decline of revenues below this level that should be prevented. It is for this reason that the type of cost-price relationship with which we are here particularly concerned is not that between prices and *total* costs but rather that between prices and the *variable* costs of mining upon which continued operation of present producing mines now depends.

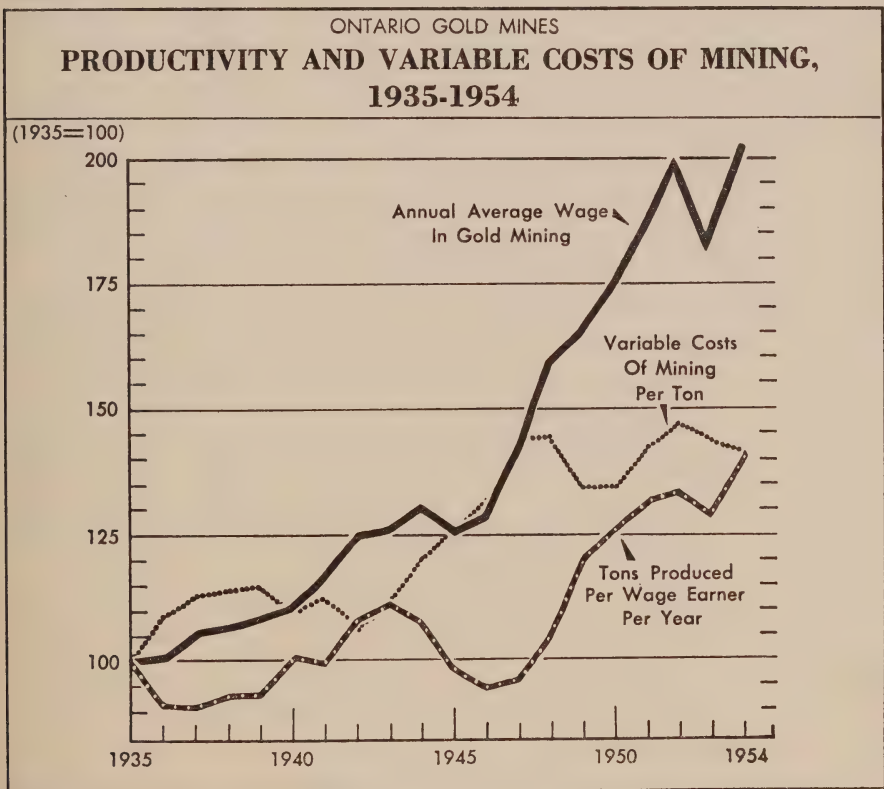
Variable costs include the costs of labour, materials, fuel and electricity required to mine ore, hoist it to the surface, extract the gold from it in the mill, and the current costs of developing ore reserves (Chart XI).



Of these items labour costs are much the most important; their trends will be considered in Chapter III. Although it is impossible from data available to construct an adequate index of such prices, it is well known that prices of some materials used in quantity by the mines, such as explosives and chemicals, have risen much less than average wholesale prices.<sup>1</sup> This lag in materials costs, though sizeable, is of secondary importance in retarding the rise in variable costs. Trends in the price of labour and in its productivity are much more important.

The measurement of the cost-price squeeze in terms of the relative movements of price per ounce and cost per ton does not completely isolate the external market forces which impinge on mining from those

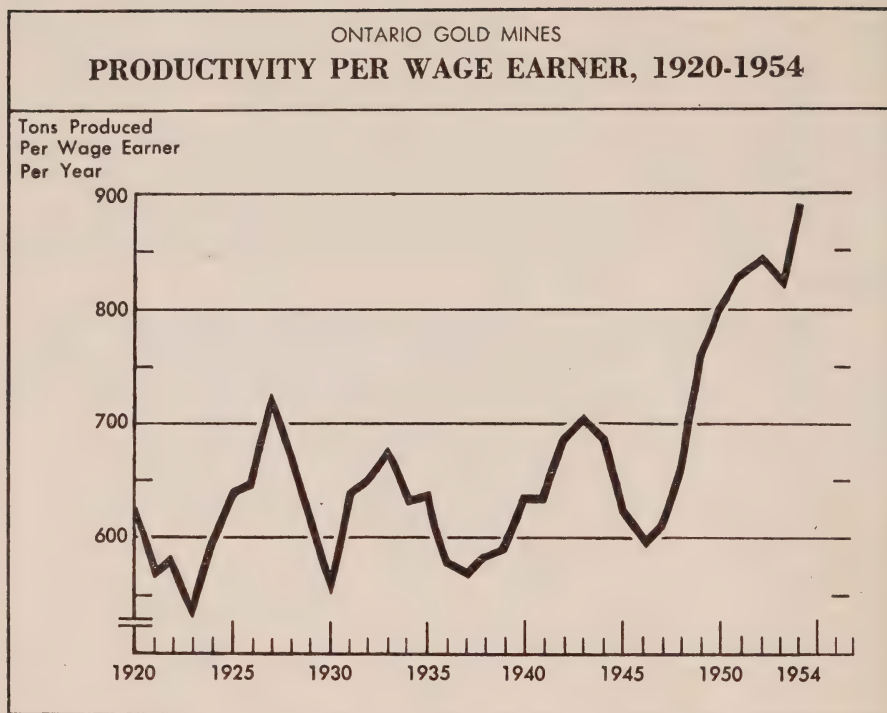
CHART XII



Source: Page 112.

(1) See Appendix VIII.

CHART XIII



Source: Page 113.

factors which are within management's control. The trends of variable costs per ton are determined not only by changes in market prices and wage rates but also by productivity trends, that is, by changes in the output per man employed.

How important such changes may be is strikingly shown by the fact that between 1947 and 1954 the level of variable costs per ton has not risen while wages have continued their very rapid postwar rise (Chart XII). Had costs continued to rise with wages, as they began to do in 1945, the situation of gold mining in Ontario would be precarious indeed. In fact, since 1947 the rise in average annual wages paid in gold mining has been matched by the rise in output per man employed. This has been the main factor in preventing costs from rising since 1947.

Relatively great fluctuations in productivity per worker are common in gold mining (Chart XIII). They have no obvious relation to the business cycle, and the rate of improvement in productivity

between 1920 and 1948 was much slower than in many other industries. It is true that over the period 1920-54 productivity, as measured in Chart XIII, grew at an average annual rate of just under 1%; from 1930-54 the rate was about 1.5%. It is much more significant to observe, however, that the years 1920-54 fell into two periods of strikingly different experience. Until the end of the Second World War productivity increased annually at but 0.3%; since 1948 the rate of increase in productivity has been a phenomenal 3.5%. Clearly the explanation of this change in the behaviour of productivity is most important in the assessment of the present position and prospects of the gold mining industry.

In an individual mine productivity is mainly affected by four factors: the proportion and nature of development and other currently unproductive uses of labour; the scale of output; technical improvements; and finally, the age of the mine. In its earliest years a relatively high proportion of a mine's labour force is used in exploratory and development work. Most of it produces no ore; shafts are usually sunk in barren rock and crosscuts have to be put out to reach the ore bodies on each mining level. Even after production has begun, exploration must be kept up until the necessary information is obtained upon which to determine the most profitable scale of operations. In new mines, therefore, the proportion of the labour force engaged in development work is high and the work itself likely to be relatively unproductive. When many new mines are being opened ore production per man will fall for the province as a whole. This probably explains the decline in productivity in the years 1927-30 and again in 1933-38. In the earlier period the Kirkland Lake camp was being developed (Chart V), and later many new mines were being created following the rise in the price of gold in 1934.

When, on the basis of the information revealed by previous development work, the most profitable scale of operations has been determined, more men will be hired and the scale of mining expanded toward the optimum. Inevitably, therefore, the proportion of currently unproductive work will fall and productivity per man will rise. When a mine has reached its intended scale of operations, when it has "matured" so to speak, development work itself becomes more productive. Less labour is devoted to exploration in barren rock and



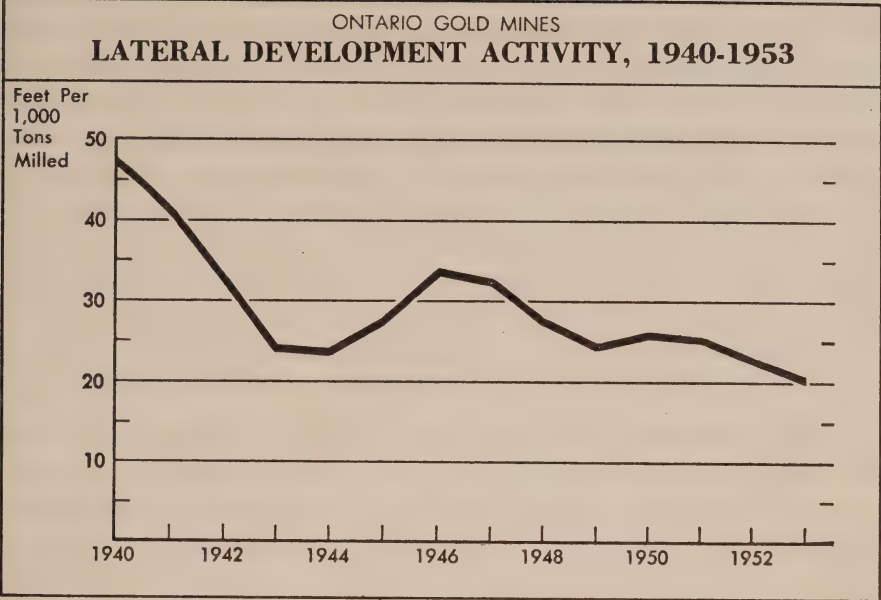
more to the preparation of the ore bodies for mining, work which itself produces some ore worth milling. The increase in the scale of operations also greatly improves productivity. Mining machinery is now more fully used; the working force is large enough to permit specialized workers to be employed steadily at the jobs for which they are best fitted; the organization of management may be improved by similar specialization of function. In the years 1923-27 the rise of productivity was probably due in no small part to the expansion in the scale of production of such mines as Hollinger and McIntyre. In the years 1930-33 the Kirkland Lake mines were expanding similarly. In neither period, however, were new mines numerous enough to prevent the rise in productivity in the group as a whole.

Unfortunately a mine cannot go on producing indefinitely at the optimum scale as most manufacturing plants may; not only does production eventually exhaust ore bodies but long before this happens a mine gets deeper and bigger as the ore bodies are mined out. As this comes about, geological factors tend to raise mining costs and reduce output per man. Estimates made by the mines show an increase in costs of from 50 cents to \$1.00 per ton when mining is carried below 2,700 feet. As many mines now operate much below this level, this rise in costs can be very important when average variable mining costs run about \$6.19 per ton as in 1954. At depth rock walls must be more carefully supported; additional costs for timber and fill for the mined-out areas are involved; more men must be employed in this work. Not only does the cost of hoisting rise as shafts go deeper, but the distance to the ore body may increase, giving rise to greater costs of tramming ore to the shaft. Miners then take longer to get from the surface to their places of work. This unproductive travel time for which miners must be paid may amount to as much as 1 or 1½ hours in each 8-hour shift. Ventilation and similar costs will rise as mines go deeper, and the total length of underground workings increases. Thus the increase in the extent and depth of mines with age tends to reduce tons produced per man and raises the costs of power and materials used.

On the other hand, forces are at work tending to offset this declining productivity as mines age. The possibility of discovering new ore bodies diminishes and fewer and fewer men are employed



CHART XIV



Source: Page 114.

in searching for them (Chart XIV). The proportion of the total labour force directly employed in productive mining therefore grows and productivity is improved. Moreover, development work itself becomes more productive. It is directed mainly to the preparation of ore bodies for mining and so produces some ore.

In extreme old age a mine comes finally to the “salvage” stage. The decision having been taken to wind up the operation, development and other unproductive work, such as the increased maintenance which old mines require, is now cut to a minimum; a very high proportion of the labour force is working on preparing ore for the mill; productivity per man therefore rises.

In the latter years of its life a mine will thus tend to show falling productivity as its ore becomes harder to get at and more costly to bring to the surface. Except possibly in the final or salvage stage, this trend will probably dominate the opposite tendency to an improvement in productivity as development work diminishes.

That the average productivity of a group of mines should not show the improvement common in other industries is thus mainly due

to the inevitable fall in productivity as mines age and exhaust their ore bodies. Productivity may also be reduced for short periods when there is an unusual proportion of new mines. The fluctuations in productivity shown for most of the years covered in Chart XIII are thus probably due to the changes in what might be called the "age composition" of the province's mines. It falls when the group shows a growing proportion either of new or old mines. The fall caused by an excess of new mines is bound to come to an end soon; as mines mature their productivity improves. For the fall of productivity arising from a predominance of old mines there is no such natural cure, however. Productivity can be raised again only by the maturing of new mines or by some unusual factor such as a rapid mechanization.

The experience of the gold mining industry during the war was not such as to encourage mechanization. During the great expansion of production in the years 1939-41 the ratio of profits to production was very high (Chart VII). There was no great pressure for technical improvement. From 1942-44 gold mining was a non-essential industry; it had no priority for either men or machinery. In the early war years the mines responded to the appeal of the Federal Government for more production by reducing every form of development and other unproductive labour. In 1942-44 this continued to be necessary in order to economize on labour itself. Productivity during the war therefore rose sharply and stayed high (Chart XIII). In 1945-47, however, men and machines were once more to be had. Development work was resumed; new men were trained; and so productivity fell once more. The sharp rise in productivity in 1948-49 reflects in part the end of this phase of reconstruction, the restoration of a normal scale of operations and distribution of the labour force. Had the rise in productivity in those years been no higher than that already attained in the early years of the war the restoration of normal operations would be an adequate explanation. The increase has so far exceeded these levels, however, as to show clearly that some other powerful force was at work. This new force was the rapid mechanization of the mines.

Since the 1930's gold mining as an occupation has been transformed by the introduction of a remarkable set of mining machines. Almost all of the handling of broken rock is now done by machines; the

shovel has almost disappeared. "Tramming" ore is done now by electric or diesel locomotives. The last of the heavy tasks of mining has recently been ended by the development of a mechanical device for the removal of broken rock during the sinking of a shaft. The "air-leg" drill now in wide use for breaking rock is one of the most important of these machines. One man operates it. It replaces the two-man stationary drill which needed rigid supports. The new drill has a pneumatic air leg that automatically feeds it into the rock. The older drill used long and heavy pieces of steel which had to be taken to the surface regularly for sharpening; the new "hard metal" bits last much longer. The total weight of the equipment handled is thus much reduced.

Mining methods are being adjusted to the new machines and the new techniques. With the high cost of timber, more and more mine operators use preservatives and make other economies in its use. Rock-bolting, a recent technique, saves both timber and labour and helps in other ways. Steel bolts up to eight feet in length are fastened into the rock to secure it against shifting. In some cases concrete replaces timber. Hydraulic filling is increasing in use. As a mine goes deeper, the place where the ore is taken out must be filled to support the walls. A few mines are now reducing costs by piping fill in water, and by using tailings rather than other materials more expensive to obtain and distribute.

The great speed of this revolution in mining and the consequent rise of productivity is largely to be explained by the pressure on profits created by the steep rise of variable costs since 1943 (Charts XII and VII). By 1947 many mines had been forced to close; few could regard their position with equanimity. The sharp rise in wages and prices in Canada in 1947-48 made it very clear, moreover, that the rise in mining costs would continue unless drastic measures were taken. The measures taken were very effective. By a combination of new machinery and better methods of organizing mine operations, the rise in variable costs has been arrested. Pressure to make improvements remains, however. The rise in the cost level has only been halted; costs have not been reduced. Whether there will be a continued flow of new machines and better methods great enough to maintain the pace of recent increases in productivity may be questioned. It would



seem probable, therefore, that an early and great decline in the variable costs of mining is unlikely.

### **The Cost-Price Squeeze**

The great decline in the profits of gold mining since 1940 is due for the most part to the working of those market forces external to the mines, which have set the trends in prices and mining costs analysed in other sections of this chapter. Their relative movement since the end of the war narrowed very greatly the spread between prices and costs which the rise of the price of gold and the stability of mining costs had brought about between 1934 and 1943 (Chart VIIIc).

The importance of these trends in prices and costs of gold mining does not lie mainly in the great profits made possible to mines which were producing before the gold price increase and their subsequent reduction. It is rather that the new price-cost relations of the 1930's made it profitable to bring new mines into production and expand old mines so that the ounces of gold produced nearly doubled by 1940 (Chart IVa). A new gold industry was thus brought into being which depended for its very existence on the price-cost relationships established in the late 1930's. That the subsequent worsening of these relationships has sharply reduced gold production is hardly surprising; that the increase which occurred in the 1930's has not been entirely lost is due to the great improvement in productivity.

That the expansion of the gold industry was so substantial is due to the peculiarities of the demand for gold. In other industries the increased supply induced by a great price rise quickly brings a price fall; the high-price, low-cost "bonanza" does not last long. In gold mining, however, no matter what the increase in supply, price is not forced down; governments have long purses. Such rare events as the gold price increase of 1934 thus create huge and persisting windfall gains. From the gains made in Canadian gold mining in the 1930's and in the early war years have been built up some of the large blocks of capital which have since played so prominent a part in many fields of Canadian mining development.

Not all increases in production since 1934 brought very high profits, however. Some of it came from mines with high grade ore



but with costs too high to make them profitable hitherto; much of the new production came from new low grade mines or the lower grade deposits in mines already producing. For such mines there was no "bonanza"; the new high price of gold alone made them possible. The rise in costs since 1943 upset the calculations of profit possibilities on which these mines were based; they could not offset current losses against high gains from some early period. Many of them have gone under; others have a precarious hold on life. Without Emergency Gold Mining Assistance many more would have ceased production.

For the mines which were profitable before the rise in the price of gold much of the "bonanza" it gave them has been whittled away by the rise in costs (Chart VIIIc). Had there been no gold price increase in 1934 and had the war-created rise in variable costs of mining been imposed on an industry still getting \$20.67 an ounce, crisis would have hit the gold mines and the communities dependent on them ten years earlier. That these communities are still relatively prosperous, that gold mines still employ thousands of men, is due very largely to the fact that President Roosevelt chose to raise the price of gold.

In the later years of the war, however, this cost-price squeeze was still in the future and there were indeed good grounds for the optimism with which the financial community then viewed the prospects of gold mining. The Canadian dollar price of gold was still at its wartime maximum; the rise of variable mining costs had just begun (Chart VIIIc). Moreover, that rise seemed likely to be halted or reversed when the normal productivity of gold mining could be restored after the war (Chart XII). Wages, the main element in variable costs, had been almost stable during the war. Few in 1945 anticipated the great postwar rise in wages; unemployment was almost universally expected.

In the upshot, these expectations of greater mining profits have been almost completely falsified. The long downward movement of mining profits since 1940 was indeed halted in 1948 but the recovery of the next two years was a small one; the ratio of profits to the value of production continued to decline, and in 1953 gold mining profits were below the levels of 1948 (Chart VII). For this unanticipated result the postwar inflation of commodity prices and wage levels is mainly responsible. Both gold mining wages and the cost of materials used

rose sharply, although their rate of rise was less than that of wages and commodity prices generally. Moreover, this lag would not have saved the gold mining industry from a much more difficult situation than it finds itself in today had it not been for the unprecedented rise in productivity which began in 1948. During the years of low productivity in 1946-48 the average annual wage paid in gold mining and the variable costs of mining per ton moved up together (Chart XII). Had this continued to 1950 or 1951, that is, had variable costs risen as did the average annual wage, few mines could have survived. The rise in productivity in recent years, however, has prevented the further rise in costs which threatened as wages and commodity prices went on up.

The stage reached in the growing cost-price squeeze by 1948 readily explains the beginning of EGMA in that year.<sup>1</sup> In 1947 the increase in variable mining costs which had been under way since 1943 became more rapid. At the same time the return of the Canadian dollar to par with the United States dollar reduced the price of an ounce of gold from the wartime price of \$38.50 to \$35.00. Both jaws of the pincers closed more tightly from 1945-47. There now seemed, moreover, in the general North American behaviour of prices and wages, good grounds for anticipating a further increase in mining costs.

The unexpected easing in 1949-50 of the squeeze being applied by each jaw of the cost-price pincers is to be explained by the fall of the Canadian dollar when the pound sterling was depreciated in 1949 and by the reversal of the trend of variable costs because of the sharpest improvement in productivity in the whole postwar period (Charts VIIIc and XII). The relaxation proved temporary, however; by 1950 average annual wages had risen sharply, and the rise in productivity had moderated. The squeeze in 1952 was tighter than ever before. In 1953-54 both series moved downward but their relation changed little.

In the light of present uncertainty about the future movements of wages and productivity in gold mining and of the value of the Canadian dollar, whether the cost-price squeeze will tighten or relax can hardly be forecast.

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(1) See Appendix VII.

The history of its fortunes studied in this chapter plainly shows that gold mining has been influenced by the policies of governments more than private enterprises usually are. The dramatic rise in the price of gold was an anti-depression policy. In the Second World War governments first encouraged and then discouraged gold production. Fiscal and monetary policies followed by governments during and since the war must bear some responsibility for the great inflation of prices and wages. The exchange rate policies of the Canadian Government have affected the price of gold.

By increasing its productivity since the war the gold mining industry has fought a remarkable delaying action against some of the consequences of the policies of governments as well as against the gradual exhaustion of its ore bodies. The struggle is not yet over, however, nor is the outcome yet clear.





## CHAPTER 3

# labour

### Trends in Employment and Wages

The most spectacular change in employment trends in Ontario mining in recent years is that gold mining has lost its leadership as an employer of labour; base metal mining has pulled sharply ahead since 1948 and seems likely to keep the lead (Chart XVa). In the peak year of 1941, over 19,000 men were mining gold and just over 12,000 were at work in other metal mining. In 1954 gold mining employment had shrunk to 10,500 while employment in other metal mining had grown to 20,000.

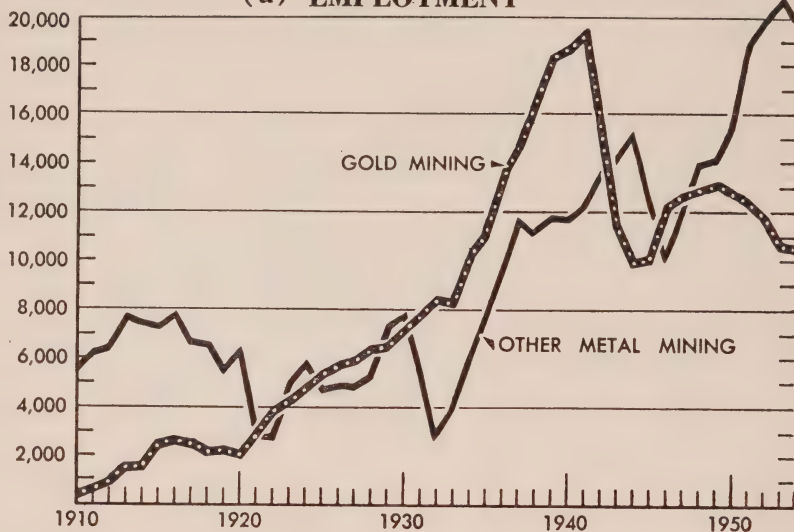
Wage trends have followed the economic fortunes of the two branches of mining in the province (Chart XVb). Between 1920 and 1940, except for two years, the average annual wage of gold miners was above that of other metal miners. In 1945 they were about equal at

CHART XV

# GOLD AND OTHER MINING IN ONTARIO, 1910-1954

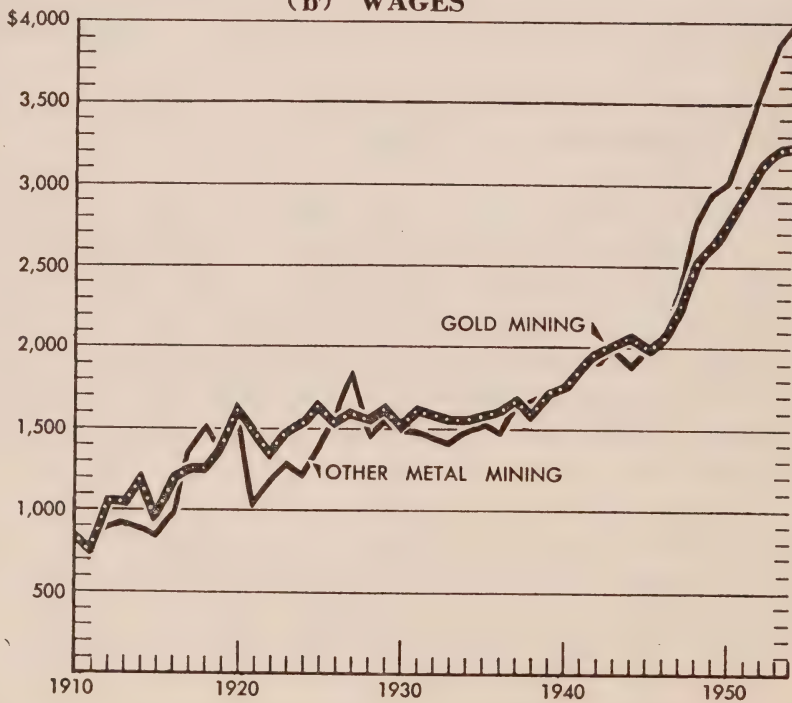
Wage Earners

## (a) EMPLOYMENT



Average Annual Wages

## (b) WAGES



\$2,000 in gold mining and \$1,973 in other metal mining. By 1952, average annual wages in other metal mining had risen 83% to \$3,609 and in gold mining by only 58% to \$3,155. Average weekly earnings of labour in all industries in Ontario in the same period rose by 73%.<sup>1</sup>

Gold miners also work longer hours than other metal miners. Over 90% of gold miners in Canada have a standard work week of 48 hours. Only 26% of other metal miners have a 48-hour week and over half of them have a 40-hour week. During recent years in Ontario actual time worked in gold mining averages 45 to 46 hours and in other metal mining 40 to 41 hours. Hazards to health and proneness to accidents are, despite great advances, still important disadvantages of gold mining.<sup>2</sup>

The estimates of even the most favourable combination of future cost-price factors to be considered in Chapter V do not suggest any renewed rapid growth of employment in gold mining in Ontario. A rise in the price of gold, discovery of new rich ore bodies, or the introduction of further remarkable cost-reducing innovations might, of course, alter present employment trends. Such factors aside, however, there is little chance of wages being considerably lifted by an increased demand for labour in gold mining. If there is to be an improvement in money wages, the pressure must come from a growing scarcity in the labour supply.

Despite the higher money wages paid in other mining and in industry in southern Ontario, the gold mines have been able to retain the labour they need. Why do the miners stay? It may be that real wages in gold mining towns are higher than money wages suggest. Rents, for instance, cannot rise much where tenants are fewer than they used to be. Men are deterred from leaving the gold mining towns not only by the money cost but also by the probable loss of some part of their investment in real property should it have to be sold on a dull market. In other mining areas, unfamiliar conditions

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(1) Toronto average weekly earnings in all industries also rose by 73%. The Consumers Price Index in the same years rose 55.3% and the wholesale price index 68.3%.

(2) See Appendix IX.

of work, possible scarcity of houses, and other disadvantages discourage venturing into new regions or occupations.

Gold mining as an occupation also has some advantages. Since in many industries seasonal variations are very large, the steady employment which the gold mines offer is a major attraction, especially to heads of families. In the gold mines something like a "guaranteed annual wage" has long been a reality.

In gold mining men usually work in very small groups or in pairs. This permits the exercise of individual skill and initiative which many men enjoy, and the earning of an "incentive bonus" which averages about 20% of basic pay.

What is known of the characteristics of the labour force in gold mining suggests that the older gold miners at least find a sufficient advantage to induce them to stay. In Ontario, gold miners are, on the average, older than other miners. In Porcupine and Kirkland Lake 40% of all employees are 45 years old or more; in Larder Lake and Red Lake 16%. The percentage of married men is higher in the older camps. In Kirkland Lake over 40% of all employees have been with the same employer ten years or more; in Porcupine and Geraldton some 34%; in Larder Lake and Red Lake less than 10%.<sup>1</sup> At the same time, turnover of labour is large in gold camps and the proportion of recently arrived immigrants is greater than in other mining.

These characteristics of the gold mining labour force suggest a core of older married employees who are likely to stay in gold mining and a group of younger men and immigrants who probably think of their employment in gold mining as temporary. As employment declines, the younger men are the first to leave.

If present trends in costs and revenues in gold mining persist, it is hard to see how demand for labour can much expand; it may indeed decline. At the same time, the peculiarities of gold mining as an occupation suggest that the supply of labour may remain larger than it would in other occupations in the face of similar trends in production.

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(1) See Appendix X.



## Collective Bargaining

These trends in employment and wages explain why labour unions have been less important in gold mining than in some other industries. Despite the great expansion in employment in gold mining during the 1930's, wages rose very little because there was large scale unemployment elsewhere. As a result, between 1930 and 1935 there was a 56% increase in wage earners but only a 6% increase in the average annual wage. Even after the general revival in industrial employment in the late 1930's the gold mines were able to increase their labour force between 1935 and the peak year 1941 by 74%, by raising their average wages only 16%. Clearly, conditions in gold mining up to 1941 did not encourage the rapid growth of labour unions.

Since that time, though national efforts to unionize labour have been favoured by the scarcity of labour, the efforts to organize labour in the gold mines have been hampered by a relatively plentiful labour supply. The Kirkland Lake strike occurred in 1941 when production had already passed its peak and gold mining was soon to be classed as a non-war industry. It failed to win recognition for the unions. The postwar union drive culminated in a strike in Timmins in 1953, although by 1952 employment in the mines had already lost one-third of its postwar gains (Chart XVa). If the prospects for gold mining do not improve more than at the moment seems probable the conditions of demand and supply for labour are not likely in themselves to bring great improvement in wages, hours, or the terms of employment. To improve them by union action may be harder than it normally is in other occupations.

In such circumstances good collective bargaining relationships may be hard to attain. They are created by a willingness on the part of labour and employers alike to bargain in good faith and by a considerable experience in making collective bargaining work. There is danger that the appearance of these attitudes of mind may be delayed if either owners or labour leaders tend to determine their views as to the merits of local disputes by national or even international considerations. Power struggles within a given trade union, or the general strategy of inter-union competition on the national scene, may dictate

action not necessarily in the local interest. Opposition to trade unions as such or to the views of their leaders on economic or political questions may prevent owners from acceding to local requests which might otherwise be assented to.

That such considerations are important in explaining the lack of a well-established habit of bargaining in good faith has been noted in recent years in the reports of boards of conciliation and arbitration. It is to be hoped that attitudes on both sides will undergo some modification in the interests of the people in these communities.



**MEN WHO MINE GOLD** — Men waiting to be hoisted to the surface at Hollinger Consolidated Gold Mines, Timmins. The gold industry in Ontario now employs 10,500 workers and is the principal support of communities where 70,000 people live.





**AIR TRAVEL IN THE NORTH —**  
Pontoon-equipped aircraft taking off from Red Lake in north-western Ontario. Particularly in the Red Lake and Pickle Lake regions, aircraft have been indispensable in the development of gold mining.



**DOWN TO EARTH SEARCH —**  
In the foreground a geologist examines a "core" of rock brought to the surface by the diamond drill. There is almost no outside exploration for gold today. Seventeen producing gold mines reported outside exploration to this Committee. While many other minerals have been discovered, these companies listed only four gold prospects found in four years.





AN ONTARIO GOLD MINE — Madsen Red Lake is one of the province's newer gold mines in northwestern Ontario and began production in 1938. Its townsite surrounded by bush, is at centre. The nearest other community of any size (approximately 1,200 population) is Red Lake, ten miles away.





**SIXTY MILES TO MANITOBA** — The community of Red Lake is the principal centre of six producing gold mines within 60 miles of the Manitoba boundary in northwestern Ontario. The isolated townsite began when the now-exhausted Howey mine was developed in the late 1920's. Some of the newer Red Lake mines are still expanding.

**FORTY YEARS OF GOLD** — The Kirkland Lake camp has been producing gold for 40 years and in a big way, for 30. It ranks after the Porcupine as the province's largest producer to date. The headframes of six of its seven present producers are close together, forming the famous "Golden Mile", of the northern community.





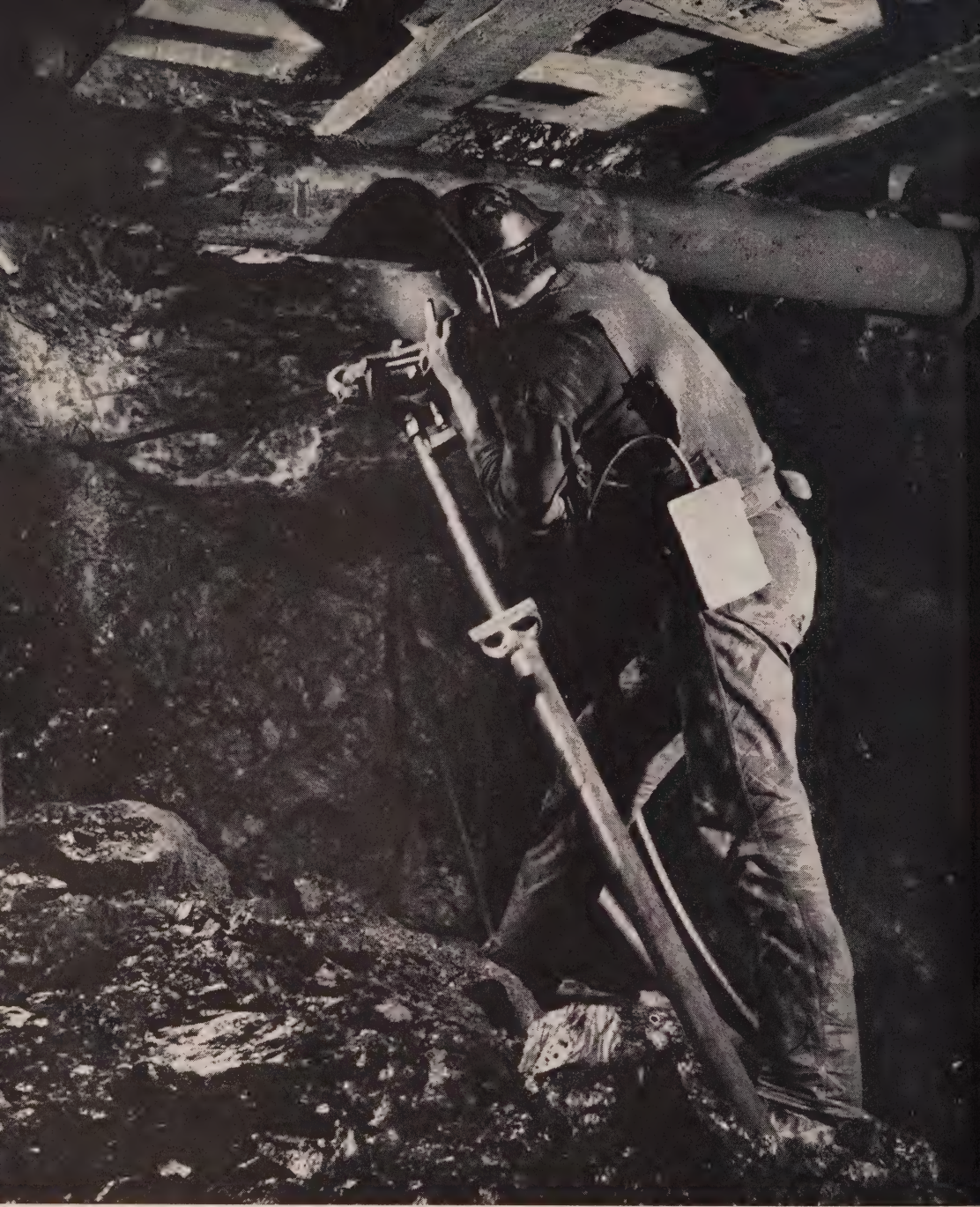


**CITY BUILT ON GOLD** — Like Kirkland Lake, Timmins (population 27,342) is almost solely dependent on gold. Unlike the Kirkland Lake camp, the mines are scattered over several miles. In the background may be seen the headframes of McIntyre and Hollinger, two of the 14 producing mines of the Porcupine area.

**ONTARIO'S LARGEST PRODUCER** — The province's largest individual gold mine is Kerr-Addison at Virginiatown, only three miles from the Quebec boundary, and approximately 30 miles east of Kirkland Lake. Kerr-Addison began production in 1938, and in 1954 produced more gold than the entire Red Lake camp and almost as much as the Kirkland Lake camp.







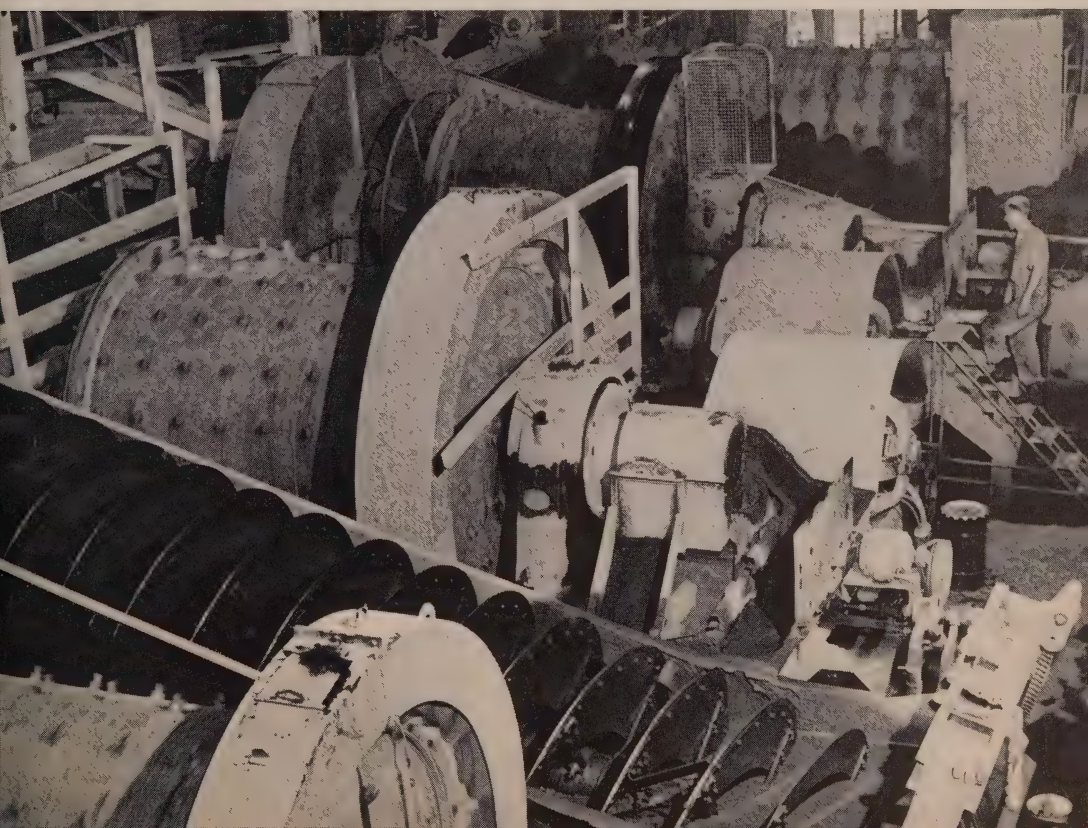
**NEW DRILL SAVES LABOUR** — The air-leg drill such as that shown here has been a major element in increasing productivity. One man operates it. It replaces the two-man stationary drill which needed rigid supports. A pneumatic leg feeds the new drill's hard tungsten carbide bits into the rock.



### SHOVEL IS RARE NOW —

The shovel has almost disappeared from mining. Almost all of the handling of broken rock is now done by machines, of which this loader is typical.

THE MAJOR LABOUR COSTS — are for underground work. Once the ore is mined and brought to surface, its milling is relatively automatic. Below, one man watches the ball mills and classifier units which grind and size the ore, preparatory to the extraction of its gold with cyanide solution.







**AND FINALLY GOLD** — In 1954, Ontario's 33 gold producers yielded \$79 millions worth of gold, over one-half of all the gold produced in Canada. This figure, of course, was much below the 1940 peak which reached over \$122 millions.

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Hugh Thompson, C.M.M.A., George Hunter,  
George Hunter, C.M.M.A., George Hunter.

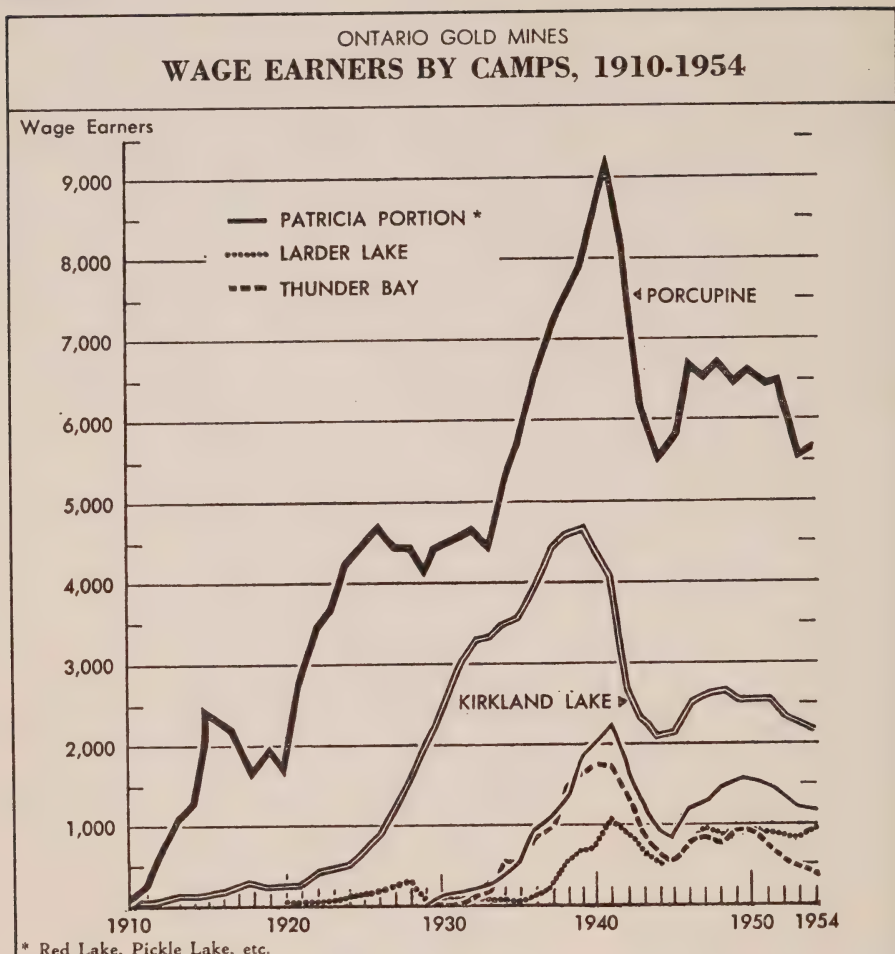
## **the gold mining communities**

Ontario's gold mining communities are relatively remote from the province's larger centres of population. All of them are in northern Ontario, scattered from the Quebec boundary almost to Manitoba (Chart III). In addition, sometimes hundreds of miles separate one gold community from another. The Porcupine, Kirkland Lake and Larder Lake areas are concentrated in the northeastern part of the province and all within 85 miles of the Quebec boundary. The Longlac camp is east of Lake Nipigon, while Red Lake is less than 60 miles from Manitoba.

Some mines stand alone in their camps. Kerr-Addison is by itself at Virginiatown within a few miles of Quebec and some 30 miles from Kirkland Lake. Pickle Crow, the most northerly producer, is 175 miles east of Red Lake. Renabie, the only gold mine in the Sudbury District, is 120 miles due west of the Porcupine; Young-



CHART XVI



Source: Page 116.

Davidson, in Matachewan District, is 50 miles southeast. Leitch is 50 miles west of the main development of the Longlac camp at Geraldton. Ross, although considered part of the Porcupine camp, is at Holtvre 50 miles east of Timmins.

Although gold has been produced in many parts of Ontario, 82% of it has come from the Porcupine and the Kirkland Lake camps. In 1954, these two camps still produced 62% of the province's total. They supported 55,000 or 79% of the 70,000 population of Ontario's

"gold mining" communities. By their size alone, they present the major problems of adjustment to changing gold mining trends (Chart XVI). Their largest communities, Timmins and Kirkland Lake, would show the most significant impact of any unfavourable shifts. While both of these are almost solely dependent upon the one industry, they do not depend on any one mine.

Every gold mining town reaches its peak with the mines' maximum production. Output stabilizes. Eventually, the mines exhaust their ore and reduce their production. Unless there are new mines or alternative industries, the towns must then decline. The rise in the price of gold in 1934, by prolonging the life of existing mines and creating new ones, gave new life to the mining towns. Nine of the fourteen producers in 1954 in the Porcupine were developed after 1934. At Kirkland Lake the expansion came more from existing mines than from the development of new ones. In many parts of northern Ontario the newer mines were encouraged by, and are still producing as a result of, the gold price increase. However, ore cannot last forever. Some day an inevitable decline must come to the existing gold mines.

Even when the industry is expanding, however, the gold mining communities have some special problems. Both individual and municipal planning are handicapped by uncertainty over the future. No one can forecast how long housing or municipal facilities and services may be required. No one can say how long the towns will last, how long the people will stay.

Because of the lack of alternative occupations in the area, the miner and his family are especially dependent upon employment in the mines. There are few jobs for young men and almost none for young women. The tax base of the mining municipalities is therefore uncertain also.

Municipal governments are limited in their power to tax mining property, since most of its value is underground and thus not subject to a real estate tax. Provincial assistance to mining municipalities is therefore relatively large.

When the peak in gold production has been passed, old problems become more serious and new ones appear. The general feeling of uncertainty may give way to a pessimistic trend. The impact of this attitude is greater today because of the relative expansion elsewhere in Canada and in so many parts of northern Ontario. In comparison with the rapid growth of other areas, stability seems like decline. As mining methods improve, jobs get fewer even though the level of production is maintained. Empty houses appear and property values fall, causing the miners to lose a part of their largest asset. However, there are off-setting factors. Houses probably did not cost as many year's wages as they would have in some higher cost industrial centres. Declines are not sudden, and families may have a chance to live out most of the value of the asset.

The character of the community also changes. Families replace the single men who are typical of the mining boom town. Education costs therefore grow. Welfare costs increase with an aging population and the inflow of older people from the surrounding country attracted by low rents. Timmins and Kirkland Lake, for instance, are the only large centres in their areas and are forced to undertake social and welfare burdens which benefit the surrounding districts.

The community problems at Red Lake or Virginiatown differ from those of Timmins or Kirkland Lake. Several Red Lake mines are still increasing employment and production as is Kerr-Addison at Virginiatown. In these newer, expanding camps the mines themselves bear much of the community risk-taking. Balmertown in the Red Lake camp is a particularly conspicuous example of this. Even in so old a camp as the Porcupine many mines operate in a somewhat similar fashion and have their own townsites.

Geraldton is in another circumstance. Founded as a gold mining community, it was the principal centre of the Longlac camp which at its peak in 1940 had twelve producing mines. Today, only two mines remain, one near the town, one fifty miles west. Geraldton is now close to considerable pulp and paper activity, is a distribution and shopping community for a large area, and a jumping off spot for the early development of the Manitouwadge base metals camp. For



the moment, a population of 3,100 seems to have made the necessary adjustment to the sharp declines in employment that came as the gold mines closed.

For the older camps, however, this adjustment has yet to be made. It may well be that the growth of northern Ontario itself will assist this process by affording a new basis for the economic life of the gold mining towns. The past ten years have brought a rapid expansion in population and wealth throughout northern Ontario. Spectacular uranium and base metal developments are already underway; there should be more to come. Although the growth of other industries in the gold mining towns has been hard to promote when the market was in the South, it ought to be easier as the market in the North grows.



## **wage rate changes and employment**

The future employment-giving possibilities of the existing gold mines of Ontario will largely depend on the rate of exhaustion of their ore bodies and the trends in the cost-price relationship. As ore bodies do not suddenly and unexpectedly come to an end, the major uncertainties in the trend of profits and of employment in gold mining in the near future must lie in the cost-price situation.

In Chapter II it was concluded that the United States cannot be counted on soon to raise the price of gold, and that an early and sizeable rise in the Canadian dollar price of gold because of a depreciation of the Canadian dollar is not assured. An early and substantial improvement in employment because of a rise in the price of gold is thus unlikely. Government emergency assistance as a revenue for the mines is not considered here, as the need for it is one of the questions at issue.



In determining trends in variable costs, materials costs are secondary. As the trend of their prices is uncertain, little can be said about probable future movements in this element in costs. Labour costs, on the contrary, are both primary and subject to pressure to move them upward. The possible effects of increases in labour costs upon the employment given by producing mines is therefore worth careful consideration.

All conclusions about the effect of increases in labour costs upon total variable costs must be modified, of course, by estimates of probable trends in productivity. Since 1948 variable costs have been held stable on the average by increases in productivity (Chart XII). The reasons for this impressive performance by the mines were discussed in Chapter II. They give some ground for doubting whether productivity can continue to rise at the rate of recent years.

Work in the higher paid base metal mines or in industries in southern Ontario which require qualifications similar to mining are the main employment alternatives which face a gold miner today. To represent the base metal alternative, "Sudbury" wages and hours have been chosen. To indicate the other possibility, wages and hours in the "Iron and Steel Products" manufacturing industry in Toronto have been selected and are called, for short, "Toronto" wages and hours. To introduce "Sudbury" wages and hours would cost the gold mines an additional 54% for labour; "Toronto" wages and hours would cost them an additional 31%.<sup>1</sup> The year 1952 is chosen because it was the last year before the Timmins strike.

If we assume the forty hour week and "Sudbury" wages, and if we further assume that no action is taken to improve the grade, 22 of the 33 Ontario producing mines would pay out as variable costs a larger sum than they would receive from the gold now being produced; they would make a loss on operations and would have nothing for depreciation, depletion or profit. A few of these 22 mines might for some years avoid loss on operations by raising the grade of ore mined. Given time, others might meet operating costs by a combination of an increase in the grade of ore mined and

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(1) See Appendix XI.

improvements in productivity. But, since actual operating losses could not be tolerated for long, the decision for perhaps 18 of these 22 mines, employing two-thirds of the province's gold miners, would probably be to go on a salvage basis if Sudbury wages and hours had to be met and if no public aid were available to them.

If we assume the forty-hour week and "Toronto" wages, and if we further assume that no action is taken to improve productivity or raise the grade of ore mined, then 15 of the 33 operating gold producers in Ontario would likely find themselves with an excess of variable costs over revenue from gold produced; a number of others would have a very small excess of revenue over operating costs. Of these 15, perhaps 8 might, were they so minded, cover their out-of-pocket operating costs for a short time by raising the grade of ore mined. Given a little more time, the majority of the present gold producers in Ontario might, by raising grade and improving productivity, adjust to this situation well enough to break even on operations or even to earn for a number of years something toward overhead costs and profits. There would remain, however, a minority of mines now employing altogether about 13% of the working force which, without emergency aid, would not be likely to cover operating costs by any probable change of grade or improvement in operating efficiency.

The above argument is based on data available for 1952; the 1954 data suggest that the respective increases in labour cost would be higher still at 60% for Sudbury conditions, and 34% for Toronto conditions. Despite this greater differential, about the same number of mines would be affected. This suggests that some mines, through slight grade changes, increased productivity and improved ore positions, have been able to make some of the necessary adjustments. Had they not, the number of potential casualties under 1954's conditions would have been greater than under the 1952 conditions. Nonetheless, using 1954 data, if the Sudbury conditions of wages and hours were applied to the gold mines, for many mines, they would not only eliminate all excess revenue over variable costs, but if the mines were to continue, the mine owners would be faced with a direct out-of-pocket loss. In short, revenues would not meet variable costs.

This critical situation would apply to 18 mines. For a probable 16 of them, consideration would have to be given immediately whether or not to go on salvage basis. These 16 mines employ 60% of the province's gold mining labour force.

Using 1954 data for "Toronto" wages and hours would leave 14 mines with no excess over variable costs. One of these might adjust to the situation. The other 13, employing 39% of the labour force in Ontario gold mines, would probably have to go on a salvage basis.

The comparison of these two years suggests that the mines have adjusted in part to the increased costs. That a larger number of them would be forced to go on salvage under the 1954 conditions indicates the greater severity of the increased cost differentials, as well as the fact that the ability to adjust today is considerably less than it was in 1952.

These conclusions involve a considerable measure of judgment particularly as to the possibility of offsetting higher labour costs by improvements in productivity or by raising the grade of ore mined. The chance that exchange rate movements may ease or worsen the cost-price situation at any time must also be borne in mind. The present position and possible trends in the cost-price situation in Ontario gold mines nevertheless present a serious policy problem.

Under the existing regulations, half the increase in costs of gold mining is borne, for at least two-thirds of current production, by the Federal Government under authority of the Emergency Gold Mining Assistance Act. It has been argued that the wages of gold miners could be raised to any reasonable degree without reducing employment as the added costs would be borne by emergency aid. If the gold mines had to meet "Sudbury" wages and hours, costs would be so raised, according to the above calculation, that EGMA to Ontario gold mines would be more than doubled. Even so, 10 mines employing over one-half of the province's gold miners would still be making such substantial losses that they would probably have to go on a salvage basis. If "Toronto" wages and hours had to be met, EGMA payments would be increased by two-thirds by the resulting rise in costs. With that level of aid, most mines could make adjustment by improvements



in productivity and an increase in grade, but some mines, employing 13% of the labour force, would probably be forced to close.

Since the continuance of emergency aid even on present scales has been put in question by the Federal Government itself, it is hardly likely that mine operators would take the possibility of aid on much greater scales seriously enough to make the adjustments in grade and other matters required to confirm the above estimates.



## **concluding observations**

The average annual level of wholesale prices in Canada rose by 81.8% between 1945 and the peak year of 1951. When there is so great a rise in so short a time, individual commodity prices move upward at very different rates. The relationship of sales revenues and costs of raw materials and labour is disrupted. For industries whose prices rise faster than the average, paying higher wages and meeting increased prices for raw materials is easy. Others in the opposite case find themselves in a tightening "cost-price squeeze" against which they struggle by resisting increases in wages and striving to improve their efficiency.

Of the latter class of industries, gold mining is a striking example. The price which Washington pays for an ounce of gold has not been changed since 1934. Since then, prices and wages have more than doubled. Had the cost of power, materials and labour used in mining a ton of gold ore risen in anything like that proportion, few gold mines



would now be in production. But the prices of materials used and the wages paid in the gold mines have both risen less than the national average. By a great investment in more productive tools and machinery and improvements in mining methods since 1948 the rise of the cost of mining per ton has been halted. Nevertheless, costs have risen considerably, and most mines have made much lower profits since 1940. Some mines have closed; others might have done so had not the Federal Government begun giving emergency aid to gold mines in 1948.

From this reversal in its fortunes it should not be concluded, however, that gold mining is near collapse. Gold has not been abandoned as a monetary metal. Though the United States shows no inclination to raise the price of gold, it is buying gold as offered.<sup>1</sup> Production of gold in Ontario is still at high levels; many workers are employed in the gold mines and their earnings support large communities. It is probable that if great increases in costs occur soon, or if aid is withdrawn, employment in the mines would be seriously reduced, and the economic life of the mining communities made very difficult. Given time, and a not too rapid rise in wages, increasing productivity should make it possible for most of the mines on which these communities depend to continue production on a scale large enough to keep the towns going for some years. In that case the rapid growth of northern Ontario should greatly improve the chances of attracting other industries. With such a possibility ahead of the gold towns there are no good grounds for planning now for their abandonment.

Developments in the next few years should do much to clarify the position of gold mining and the gold mining communities. Present price, wage and exchange rate levels should be confirmed or new trends established. It should then be easier to appraise the possibility that general economic development may compensate for the decline in gold mining. Meantime, emergency assistance to the mines should be continued by the Federal Government. Its levels and method of apportionment should be reassessed periodically in the light of events

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(1) See Appendix II for comment on the diminishing role of gold in Canada's balance of international payments.

as they bear on employment in the mines and on the welfare of the gold mining communities.

Where communities are dependent upon industries in which employment is steady or slowly declining, it is generally true that the local supply of labour tends to be relatively large and incomes tend to be relatively low. The young people of such communities may not move away in the numbers necessary to keep local wages moving with the national trend. Labour mobility should be particularly encouraged in such situations. Youths should be as well trained as they are in more prosperous communities. To assure the health and adequate training of the young Canadians who grow up in the mining communities, education, health, social and municipal services should not only be maintained; they should keep pace with their growth elsewhere. If long-lasting structures such as schools or hospitals are involved, they should be provided even though their use for a normal life be uncertain. The mining communities now receive payments from the Provincial government, not only through the regular grants for education, health and welfare, but also by special grants. Since standards in the public services of the province constantly improve, the Provincial Government should keep under review the adequacy of these grants to the gold mining municipalities. To make the best use of the national labour force, those seeking employment in these communities — whether youths, older workers or immigrants — should be kept fully informed of the full range of occupational opportunity which Canada has to offer. Thus, through the schools and the employment service, the Provincial and Federal governments can contribute to the health and education of the labour force in the mining communities and encourage the individual to make the best use of his capacities either in gold mining or some other occupation.





## **appendices**



# APPENDIX I

## Ore Reserves as Affected by Changes in Costs and in the Price of Gold

The effects of rising costs and changes in the price of gold upon the mines is of such importance that the committee asked each mine to express an opinion as to the probable effect upon it of various degrees of costs and price changes. The tables appearing below are compiled from the replies made by eleven mines that were able to give a quantitative estimate as to the effects on ore reserves of the stated degrees of change in costs and prices.

APPENDIX I: TABLE 1

### IF THE PRICE OF GOLD WERE INCREASED BY

	5%	10%	25%	50%
Ore Reserves would be increased by the following percent-ages:—				
Mine "A"	3	16	17	50
Mine "B"	...	5-10	25	...
Mine "C"	10	20	50	80
Mine "D"	...	...	2	30
Mine "E"	0.5	5-10	30-40	50-100
Mine "F"	4	8	18	42
Mine "G"	20	40	100	100
Mine "H"	...	...	...	...
Mine "I"	15	45	75	135
Mine "J"	...	12	30	75
Mine "K"	...	...	93	...

### IF THE COSTS OF PRODUCTION INCREASED BY

	5%	10%	25%	50%
Ore Reserves would be reduced by the following percent-ages:—				
Mine "A"	5	10	20	30
Mine "B"	5	30	100	...
Mine "C"	Nil	20	60	100
Mine "D"	6	10	100	...
Mine "E"	5	10-20	40	100
Mine "F"	Nil	12.7	32.7	66.7
Mine "G"	15	20	42	65
Mine "H"	2	11	33	63
Mine "I"	43	80	100	...
Mine "J"	...	9	19	73
Mine "K"	35	69	100	...



That the mines are still in possession of enough marginal ore to have their ore reserves greatly increased by a large rise in the price of gold is evident from these replies; sheer physical exhaustion of ore bodies within a mineable range is not yet the most important problem. That the problem is costs (or better, the cost-price situation) is suggested by the great effect which a 10% increase in costs is estimated to have on ore reserves.

When the effect of price and cost changes on the profitability of mining as well as on the volume of ore reserves is allowed for, important consequences were to be expected. Their probable response to "better conditions" was reported by twenty-one mines. There would be development at depth within their own property or on adjacent properties, deepening shafts, replacing old equipment, a general "expansion in every way." This expansion might not increase the size of the mill; some mines indicated that they were now operating at less than capacity and could increase their daily tonnage substantially without any plant expansion. In these cases, the main effect of better cost-price conditions would be to extend the life of the mine. Other mines say more mechanization would take place; it is not justified under today's uncertain conditions.

An improved cost-price situation would bring about the reopening of at least two former producing mines. On others which are close to the limits of ore on the parent property, adjoining properties would be developed or present development plans expanded. To produce this effect the improvement would need to be substantial however. A moderate improvement might, according to several mines, merely allow them to get their money out of their gold properties into other investments more quickly.

However, there are many marginal showings of gold in northern Ontario, some of them close to present camps, that would be more actively prospected. While much of northern Ontario has been combed over in the years since the gold price rise, it is just possible that increased prospecting activity for gold might uncover some favourable gold prospects even at today's high cost position. While the odds may now be very much against the discovery of any more large and wealthy gold mines, they always have been so, but this is far different from saying that there will never be any more gold mines developed in Ontario.

## Gold in Canada's Balance of International Payments

It is sometimes said that the gold industry should be maintained because of the great importance of gold exports to Canada's balance of payments, particularly in depression years. At such times markets for other commodities are hard to find and the prices of our raw material and food exports fall sharply. Not so with gold, however; the United States government buys at a stable price all the gold we can produce. There is no limit to the market and no cut in the price.

During the depression of the 1930's gold exports were of considerable importance in our balance of payments. In the two years 1935-37, for instance, gold exports averaged 14.5% of our total merchandise exports, the average gold export being \$132 million and merchandise exports \$909 million. In the first two years of the second World War, before other methods were devised to finance essential war imports from the United States, the Canadian government urged all-out gold production upon the mines. The great rise in gold production in these years is to be explained in part at least as the mines' response to this request.

It is most unlikely that gold exports will regain such relative importance in war or peace. Even if the price of gold were to rise as have the prices of most other commodities, gold would still be a much smaller proportion of our total exports; other exports have grown not only in price but in quantity. Gold is no longer the only metal which the United States government buys in large amounts. In wartime, purchases for the strategic commodity reserves are likely to assure a market for most Canadian metals; in peace the use of industrial materials in the United States economy is bound to grow rapidly.

But even if gold were the only export for which an assured market at a stable price was always available, it is hard to see how the level of gold production in Canada is to be expanded to the level required to make gold exports a significant means of meeting our international obligations. In face of much more attractive alternative investment opportunities, private capital is not likely to be put into the search for new gold mines on the scale required to maintain, much less to expand, gold production. It would not be wise to depreciate the Canadian dollar on the foreign exchanges just to raise the price of gold; the repercussions of such action on the economy would be too widespread. To raise the level of direct assistance to the mining companies far enough to induce private capital to return to the search for new gold mines is not only politically impossible but economically doubtful. There is no guarantee that such expenditures would find new gold deposits on the scale required; there are other ways of handling the problem of lack of balance of international payments. If aid to the gold mining industry is required, the need for it must be demonstrated on other grounds.

## Capital Expenditures By Ontario Gold Mines

Capital expenditures in Ontario gold mining have led production trends by two years or more. There were peaks in 1938 and 1948 followed by production peaks in 1940 and 1950. A trough in capital expenditures in 1943 was followed by one in production in 1945.

Since 1948 there has been an overall decline in investment in mine and mill. The postwar spurt was due to the development of newer mines, the replacement of old equipment, and the mechanization of the mines, much of which has already been accomplished. In 1954, however, there was an increase even when Kerr-Addison's expenditures were not included. Much of it was again in the Red Lake camp, although several Porcupine mines invested more than in 1953. There were only small gains in Kirkland Lake. Kerr-Addison recently has had large capital outlays; according to its annual reports, capital expenditures amounted to \$522,578 in 1952; \$267,559 in 1953, and \$1,146,250 in 1954.

Since 1950, the major capital expenditures reported to this Committee by Ontario gold mines have been on crushers and hoists for deeper operations, shaft changes, and crusher stations and compressors.

There are a few Ontario mines which contemplate major capital expenditures in the next few years. Some mines are still expanding operations; others, to continue to supply their mills with ore, must undertake major projects of deepening shafts or sinking new ones, and replacing hoists. Several mines are in that position now, but hesitate to undertake the work required while the future of government assistance and of other conditions remains uncertain.

## Financial Returns from Gold Mining in Ontario

The financial returns from gold mining cannot be measured as a simple annual rate on the invested capital. A few mines have made outstanding returns on the original investment. Seven of the fifty-one mines that have paid dividends have paid 80% of the total dividends paid by Ontario gold mines. These seven mines are still producing. With the exception of Kerr-Addison which was developed in the late 1930's, they are older mines, all in production by 1921.

Sometimes reference is made to a mine "returning its capital." This implies that the capitalization figure shown on the balance sheet is the amount



of money invested in the mine (which may or may not be the case). The Committee has investigated the files in the Provincial Secretary's department for all of the present producing mines and for their predecessors in the Porcupine camp. It has found that \$14 millions only was paid in cash although the capitalization (without deducting discounts) shown on the books amounts to over \$72 millions.

Even this figure of \$14 millions for the Porcupine camp is inadequate, and does not give a cash investment figure for gold mining. When a mining company is incorporated some of the stock — perhaps half — may be issued in exchange for properties. Frequently this stock is valued at the par value of the stock and not the market value, which might be lower, and an inflated valuation is put on the properties. Additional shares of stock may be sold for cash, but at a discount, sometimes as much as 98% below the par value. For instance, the capital stock of a mine might amount to 3,000,000 shares with a \$1 par value, that is, \$3,000,000. Perhaps 1,000,000 shares are issued for properties, either of existing companies or as vendor stock to the owners. The other 2,000,000 shares might be sold for cash, but at discounts from par value, yielding the company's treasury 40, 50 or 60 cents a share depending upon the market. In total, then, the company may have perhaps \$1,000,000 subscribed in cash with which it can go ahead to develop the mine and build the mill.

Capitalization figures do not recognize the amounts spent on plant and equipment paid for by bonds or by other loans. Particularly, in the development of postwar mines, loans have been important. Parent mines have lent money to their subsidiaries to provide them with capital at relatively low rates.

Probably the best figure to show the total investment in capital equipment in Ontario gold mines is one compiled from their annual statements. Usually this figure is entered at cost, and not "written down." For present producers, it amounts to \$90 millions for buildings and equipment alone. This figure has been substantiated by the Committee's investigations which have shown a spending of approximately \$90 millions on plant and equipment since 1912.

The balance sheets of the mining companies record the value of their mining properties at a total of \$55 millions. However, two mines carry these at \$1 each, some others have written them down, and the majority has made no allowance for the ore taken from the property. So the figure closest to the true investment figure in Ontario gold mines is the \$90 millions spent on buildings and equipment (which for the province as a whole is now 85% depreciated from its original figure).

These figures cover the present producers only and make no allowance for the millions of dollars spent on now dormant properties or on prospects that never developed into gold mines.

## Outside Exploration By Ontario Gold Mining Companies

The gold mining companies of Ontario have developed many other mineral deposits throughout Canada. Partial evidence of their past activities are the many subsidiary mining operations. Nine of the province's producers in 1954 had been established by, or were controlled or operated by other Ontario gold mines, while four other producers were substantially controlled by one non-Ontario mining company.

Generally speaking, the newer expanding mines are occupied in developing their home properties while the older companies may devote more energy to outside exploration aimed at perpetuating the company when the parent property is exhausted.

However, attitudes vary and some companies are more "exploration-minded" than others. One outstanding example is the case of a medium-sized gold mine which reported to this Committee that in the years 1948 to 1954 it had examined 145 mineral properties, staked 23 and optioned 11. Of these, 75 were for gold, 83 for base metals, and 21 for uranium. Most of the gold properties were inspected in the earlier years. For instance, the company reported 40% of its 1950 expenditures was for gold, but only 10% in 1954.

Money made in silver mining at Cobalt is credited with pushing development of the gold mines in the Porcupine. The Cobalt success supplied also the skills, the prospectors, and the interest in the north. Gold mining, in its turn, has played a similar role providing the money, men and will for the development of mineral deposits elsewhere. Exploration for new mines is risky and costly; odds against success are high. The fact that mining companies are ready to enter new fields of exploration has doubtless led to the original discovery and the success of many mining ventures. The importance of this function of mining companies is shown by the large number of non-producing Ontario mines whose stocks are still actively traded on the exchanges.

Very little exploration for gold goes on today. In replies to this Committee, 17 producing gold mines listed their outside exploration. Since 1950, only nine of them have searched for gold and they have spent less than \$1 million in four years; the same group spent \$10 millions in all outside exploration and development. These companies have been active in most of the mineral fields of Canada. They have been associated with developments in uranium in the Northwest Territories, Beaverlodge, Blind River and Bancroft; iron in Northwestern Ontario and Labrador; in the

search for oil in Western Canada; and for base metals in New Brunswick, the Yukon, Manitouwadge, northwestern Quebec and throughout northern Ontario.

Two important results have been the participation of Hollinger in Labrador iron ore and of Preston East Dome in Blind River uranium. Three Ontario companies report a total of four gold prospects found within four years, and three companies report three base metals prospects discovered.

## APPENDIX VI

### Ore Reserves and Changes in Costs of Mining

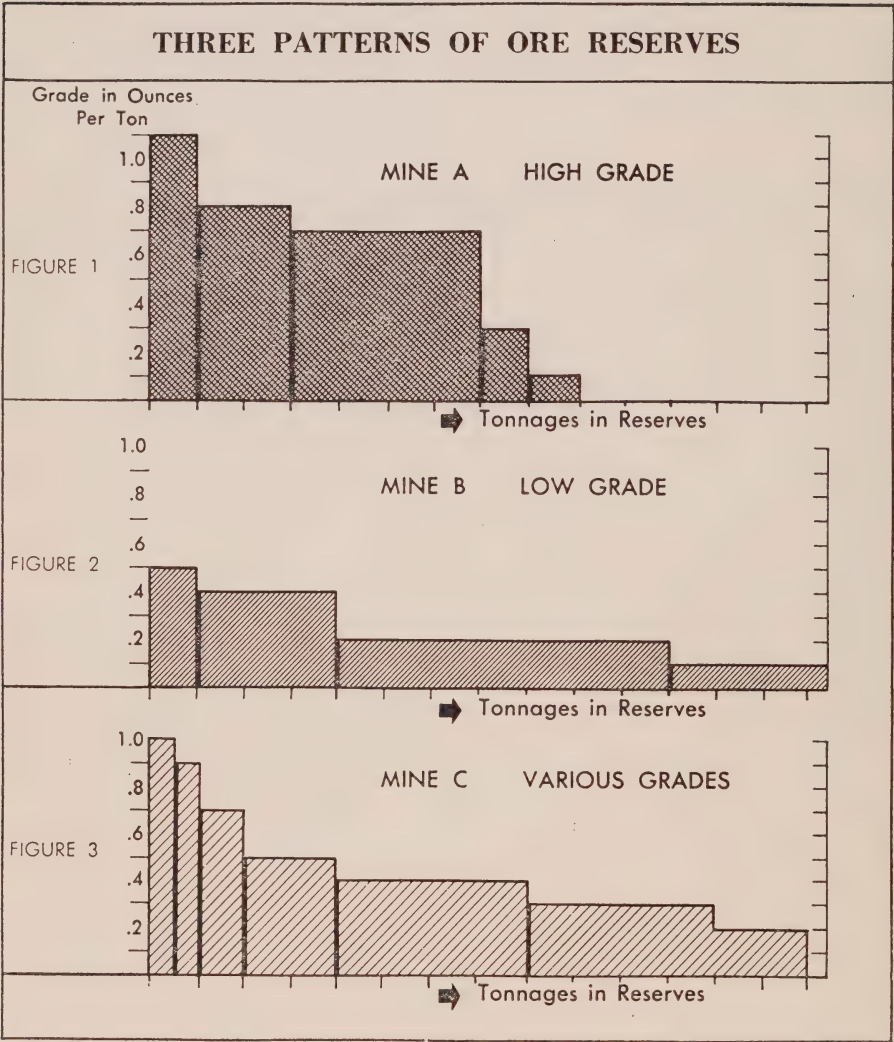
The fact that ore produced by a day's labour in a gold mine may vary in grade is sometimes made the basis of the claim that the mines, by shifting to a higher grade of ore, might cover almost any increase in costs of mining, even though there was no change in the price of gold or in the number of tons mined per worker. In order to pay higher wages most businesses must improve their productivity or get a higher price for their product; not so the mines, it is said. They need merely adjust mining practice to average a higher recovery of gold from each ton of ore mined. Since the grade per ton of ore does vary considerably not only between mines but also within any mine, the validity of this plausible argument is worth more detailed examination than would be appropriate in the text of the report.

Proven ore reserves, as reported in the annual reports of mines, may be taken as representative of the grades of ore in the mine as a whole. Some mines have a predominance of high or low grade ore (shown in a greatly exaggerated form in Figures 1 and 2, Mines A and B). Most mines, however, have many grades in significant quantities (Mine C). For convenience, both variable costs and revenues per ton are expressed in ore grades. None of these mines could operate at a cost of 1.0 ounces per ton. A cost level of 0.5 ounces would give Mine A some excess of revenue over variable costs but would leave B with none and C with but a small amount. At 0.2 ounces B could now operate; A and C would be profitable. Thus any such reduction in costs (or a rise in the price of gold which is its financial equivalent) would both expand the potential ore supply of particular mines and make new mines possible. Both these effects were experienced in 1934.

A rise in costs or fall in the price of gold reverses these effects. If costs were to rise, for instance, from 0.2 to 0.4 ounces the excess of revenue over variable costs on the existing output of Mines A, B and C would be reduced. For Mine A this would be the main effect; the ore reserves would be slightly reduced by the elimination of the 0.3 and 0.1 grades. By contrast in Mine



B both effects would be severe; most of its ore reserves would become too costly to mine and the excess of revenue over variable costs on the remainder would be very small; current operations would become unprofitable and prospects poor indeed. The same thing would be true of Mine C but to a lesser degree.



Such increases in costs would reduce both the potential ore reserves of Mine B and its scale of mining. The higher grades are scattered and the costs of mining a ton of this grade would therefore increase. But this

further rise of costs would again reduce ore reserves and the scale of mining. A spiral of shrinking ore reserves, declining scale of operations, and rising costs would thus be set off and might well force the closing of mines of type B. In the more usual type of mine, type C, the seriousness of the effect would depend upon whether it approached the B or the A type in its ore reserves pattern and in the margin between variable costs and revenues per ton. If, as in the B type mine, the initial rise in costs greatly reduces both the ore reserves and the spread between revenues and costs, the effects would probably become cumulative. If, on the other hand, the mine was more like type A, there would be a much smaller reduction in ore reserves and it would be possible to maintain the scale of operations. The main consequence would be the initial loss of the excess of revenue over variable costs; in this most unusual type of mine no spiral need follow. Thus one reaches the conclusion that the mines which are in the best position to stand a rise in costs would be able to do so with no great change in grade; and that mines which were forced to resort to a rise in grade would thereby indicate their precarious position and would fail in the attempt to adjust by this method alone.

High grade mines are usually high cost mines also. With both grade and costs high, the effects of an increase in costs would be just as serious in the high grade as in the low grade mine. If, for instance, costs are the equivalent of an 0.7 ounce grade in Mine A, an 0.2 grade in Mine B and an 0.3 grade in Mine C, a rise in costs of 0.1 grade would reduce ore reserves drastically in all these mines. Indeed, with the ore reserve patterns shown in Figure 1, the high grade Mine A would be left not only with the smallest ore reserve of the three but also with the smallest excess of revenue over costs. Any attempt on the part of Mine A to cover this increase in costs by a grade increase would put it out of existence. The earlier conclusion that the mine in the best position to stand a rise in variable mining costs is the one with a wide margin between revenue per ton and cost per ton still stands; the modification required here is in the implication that might have been drawn from the earlier discussion that high grade mines are usually in this fortunate situation. In fact, most Ontario high grade mines are also high cost mines. The possibility of their resorting successfully to mining a higher grade of ore in order to offset rising costs is probably no greater, and may be much less, than that of many low grade mines.

Adjusting to rising costs by raising grade is less likely to succeed in the older mines. The serious fall in development work that can meet a satisfactory response (Chart XIV) shows clearly that many of the province's mines are now in their old age. Selection of ore of a higher grade becomes more difficult; mining plans become rigid; in short, freedom to adjust by raising grade diminishes. In younger mines there is likely to be more elasticity in ore selection and a greater possibility of adapting mining procedure to a higher level of costs.

That the raising of grade to counter rising costs has severe limitations in the mines of Ontario should now be obvious. Most of them are in their late maturity or old age; they have long since worked out the very high grade ores which made some of them so profitable in the past. They are, therefore, unable now to raise grades very much without most serious consequence to the ore reserve position and so to the life of the mine. That the average grade of ore mined in Ontario has not much risen despite the very great rise in costs of recent years seems to confirm this conclusion.

## APPENDIX VII

### Emergency Gold Mining Assistance Act

"The purpose of the Emergency Gold Mining Assistance Act is to assist Canadian gold mine operators in meeting the greatly increased costs of production of gold for which, unlike all other primary mine products, there has been no compensating increase in price. It was designed primarily to assist the high-cost or marginal mines to continue in operation over a difficult period and also to enable such mines to continue to maintain their dependent communities."<sup>1</sup>

Payments are based on a "rate of assistance" paid for each "assistance ounce." The rate "of assistance" is defined as "50% of the amount by which the average cost of producing an ounce of gold exceeds a constant factor. This factor for the designated years 1948, 1949 and 1950 was \$18.00, with a maximum rate of assistance for these years of \$16.00. For 1951-52 the factor was changed to \$22.00 with a maximum rate of \$11.50."<sup>2</sup> The factor for 1953-54 was \$18.00 with a maximum of \$13.50, and for 1955-56 it becomes \$26.50 with a maximum of \$12.33.

"Assistance ounces" are defined "during the designated years 1948, 1949 and 1950" as the number of ounces by which the annual production exceeded  $\frac{2}{3}$  of the number of ounces produced in the base year or  $\frac{1}{3}$  of the current year's production, "whichever was the greater."<sup>2</sup> For 1951-54 the fractions became  $\frac{1}{2}$  instead of  $\frac{2}{3}$  and  $\frac{1}{3}$  respectively. For 1955-56 the definition is  $\frac{2}{3}$  of the current production.

The effect of this method of extending emergency aid is to subsidize those mines which have a high cost of production per ounce of gold mined. It has tended also to stimulate the expansion of production since the number of ounces upon which aid was formerly paid was the excess over a fraction

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<sup>1</sup> Report on The Administration of The Emergency Gold Mining Assistance Act for the year ended March 31, 1949. (Ottawa, Department of Mines and Resources, 1949.) Page 7.

<sup>2</sup> *Op. cit.* 1953. Page 8.



of the amount produced in a particular base year. It has thus been perhaps especially favourable to those mines which are on a rising trend of production. The 1955-56 amendment does away with this particular calculation and substitutes a payment on 2/3 of the number of ounces currently produced.

The annual payments to all Ontario mines have risen from \$4.9 millions in 1948 to an estimated \$6.7 millions in 1954 and have totalled over \$40 million. There is no doubt that this emergency aid has postponed the winding up of some Ontario mines. In 1954, for instance, 9 of the 33 Ontario producing mines had an operating loss aside from aid. The losses of three of these were so great that without emergency aid they would probably have been forced to go on a salvage basis. Once that decision has been taken a fairly definite term has been given to the life of the mine. To postpone it enables the individual mine more fully to exploit its ore reserves and thus to increase the total amount of employment it is able to give over time.

APPENDIX VIII

Costs of Mining Supplies

The costs of individual items of supplies purchased by a gold mine have risen at varying rates. The table below, which the Committee has received from one producing mine, gives the comparisons for typical purchases of supplies for three periods. Both explosives and cyanide have risen only moderately from the late 1930's to the present. The impact of the large price increases in timber and steel items has been softened in part by mining methods and techniques that have minimized their use.

APPENDIX VIII: TABLE 1

COSTS OF SUPPLIES

	Pre-war 1935-1938	Early Post-war 1946-1947	1954	Percentage Increase Pre-war — 1954
Explosives — per 100 lb. ....	\$13.25	\$ 16.55	\$ 19.13	44.4
Cyanide — per lb. crude ....	12.75	12.75	15.72	23.3
B.C. Timber—per M .....	37.00	53.00	110.00	197.3
Coal — per ton .....	8.05	12.67	16.78	108.4
Drill steel — per lb. ....	.11	.14¾	.20	81.8
Grinding Balls — per ton ...	71.80	77.70	138.35	92.7
Rails — per long ton .....	66.08	123.65	—	—
Steel plate — per lb. ....	.03½	.05¼	.09	157.1
Lagging — per piece .....	.26	.40	.53	103.8

## Silicosis and Accident Prevention in Ontario Gold Mines

Two aspects of working conditions in gold mines namely silicosis and accident prevention have a significance which is economic as well as humanitarian, as they together involve expenditures equal to 5.5 per cent of total wage payments. Of the two, the silicosis problem is almost unique to gold mining although it does occur in certain other industries. The other problem, industrial accidents, is of course shared by all other industries to varying extents. As measured by current assessments made by the Workmen's Compensation Board gold mining as an occupation appears to compare favourably with many classes of construction, woods operations in the lumbering and paper industries, stone-quarrying and dressing, diamond-drilling, well-sinking, and with a number of artisan occupations.

Despite considerable improvement in the incidence of silicosis and industrial accidents over the past twenty years, it is doubtful, however, whether the costs of compensation on these accounts will be substantially reduced, even apart from the expense involved in the industry's efforts to create better working conditions. This is principally due to changes in the compensation structure which have the net effect of increasing benefits awarded to individuals for disability arising either from silicosis or from accidents.

### Silicosis

In 1926, at the instigation of the mining industry, silicosis was added to the schedule of industrial diseases under the Workmen's Compensation Act, thus introducing the principal of collective liability for miners who suffered disablement through diagnosed silicosis. In 1928, again on the initiative of the operators, the Mining Act of Ontario was amended to make it compulsory for a prospective employee to undergo a medical examination, which includes an X-ray of the chest, and to be certified by the examining physician to be "free from disease of the respiratory organs and otherwise fit for employment in a dust-exposure occupation."

Since 1926 some 1,173 cases of silicosis, and silicosis complicated by tuberculosis, have been recognized by the Silicosis Referee Board, and a substantial majority of these have occurred among gold miners, to an extent which dominates the patterns of incidence and disability.

About half of the cases so recognized over the years have died, largely with tuberculosis as the immediate contributing cause of death. It is now recognized that tuberculosis may condition, as well as ensue from, the development of silicosis.

Variations among such independent factors as the length of interval of dust exposure before contraction of silicosis by individuals, the employment level, and clinical factors make difficult any attempt to draw precise correlations from the statistics maintained by the Board. An examination of tabulated

information does, indicate however, a great deal of progress in a lowered incidence, and in a lowered interference with life expectancy. The following facts emerge clearly;

1. The number of new cases of pensionable silicosis being found in the industry has been decreasing, with a substantial downward trend from the mid-1930's to the present.
2. The average age at which men are contracting pensionable silicosis is increasing at a substantial rate.
3. The amount of dust exposure in time, required to produce pensionable silicosis has increased from 13-14 years in 1926 to 22-23 years in 1954.
4. Only 3.5 per cent of all known cases of silicosis has been found among men who started mining after 1928.
5. The average age at death among silicotics has increased from 43-44 years in 1926 to 65-66 years in 1954. Of the 31 who died in 1954, 55% were over 65 years of age.
6. The average life span from date of recognition of the condition as pensionable to death has increased from 2 years in 1926-30 to nearly 13 years for those who died in 1954. As the reduction of incidence is offset by the longer durations of pensions, assessments remain at \$2.25 per \$100 of payroll.

Measures and factors which have undoubtedly been effective in the amelioration of silicosis and its effects include:

1. Pre-employment and periodic x-ray examinations of prospective and active miners. This program provides for the rejection of men who have a history of pulmonary disease and who are thus to be considered as the more prone to the development of silicosis. In the case of active miners, periodic examination affords opportunity for early detection of silicosis or tuberculosis, and the taking of action which may reduce the degree of disability.
2. Decrease in the prevalence of tuberculosis among the general population, thus reducing the chances of outside infection of silicotics. While 92 per cent of the deaths of silicotics in 1926-30 were complicated with tuberculosis, of the 31 deaths in 1954 only 23 per cent were so complicated. Of these, all but one were more than 60 years of age.
3. Improvements in mine atmosphere, with particular reference to measures designed in detail to generate less dust in a number of individual operations and for the early and substantial dilution of such dusty environments as cannot be practicably avoided. To this end, operators in the industry have gone to a great deal of effort in providing mechanized ventilation to assist the natural ventilating pressures inherent in underground mines. Returns from 23 gold mines (App. IX, table 3) show an almost twelve-fold increase of installed fan capacity



between 1934 and 1954. Among the mines reporting, the tonnage of air mechanically handled per ton of ore hoisted rose from about 2.0 in 1934 to 7.2 in 1954. New fan installations projected at Ontario gold mines for 1955 have a capacity of 500,000 cubic feet per minute.

APPENDIX IX: TABLE 1

### FAN CAPACITY

	Number of Mines Reporting	Cubic Feet Per Minute (000)		Number of Mines Reporting	Cubic Feet Per Minute (000)
1934	6	254.8	1944	18	1644.8
1935	8	357.3	1945	18	1704.3
1936	8	434.6	1946	18	1739.9
1937	8	495.8	1947	20	1861.9
1938	9	970.8	1948	22	2228.9
1939	10	1070.8	1949	23	2503.3
1940	11	1127.4	1950	23	2571.3
1941	11	1182.4	1951	23	2616.3
1942	13	1399.4	1952	23	2651.3
1943	17	1569.4	1953	23	2901.0
			1954	23	2892.0

Since 1944, prophylactic treatment with powdered aluminum has been adopted by Ontario gold mines. Based on extensive research work by the McIntyre Research Foundation, it is designed to inhibit the solution of inhaled quartz particles by the tissue juices. In the lack of statistical controls inherent in the general silicosis problem itself, and in view of the apparent effectiveness of the other measures it is difficult to assess the real amount of benefit being derived. Much hope is held by industry that aluminum prophylaxis will play its part in further reducing the problem attendant upon the condition.

### Accident Prevention

Under the Workmen's Compensation Act, various mining activities in the province are comprised in Class 5 of the schedule (embracing some 35,000 workers employed by 326 firms in 1954), and compensation assessment rates are currently, per \$100 of payroll, as in Table 2:

APPENDIX IX: TABLE 2

### COMPENSATION ASSESSMENT RATES

Group	Nature of Mining	1954	1955
		Adjusted	Provisional
1	Gold	3.00	3.25
2	Nickel, or Nickel-Copper	1.10	1.25
3	All Other	3.00	2.50
4	Uranium	-	3.50

## APPENDIX IX: TABLE 3

**COMPENSABLE ACCIDENTS IN MINES OF CLASS 5  
PER 1,000 MEN EMPLOYED**

Year	Porcupine	Kirkland Lake	Northwestern Ontario	All Gold Mines	Total Class 5. Mines
1920	...	...	...	...	115.3
1921	...	...	...	...	117.2
1922	...	...	...	...	138.4
1923	...	...	...	...	133.0
1924	...	...	...	...	129.0
1925	...	...	...	...	137.0
1926	...	...	...	...	144.2
1927	...	...	...	...	130.0
1928	...	...	...	...	127.5
1929	...	...	...	...	117.0
1930	...	...	...	...	97.6
1931	...	...	...	...	110.0
1932	...	...	...	...	97.7
1933	...	...	...	...	87.4
1934	...	...	...	...	78.2
1935	...	...	...	...	82.3
1936	...	...	...	...	73.8
1937	77.4	124.3	185.5	108.2	80.0
1938	74.7	77.9	145.4	89.1	67.0
1939	74.9	98.4	117.6	91.5	65.7
1940	69.5	67.8	117.3	79.6	58.3
1941	71.1	65.5	109.7	77.9	58.7
1942	68.4	58.5	111.7	75.1	59.3
1943	67.3	75.3	140.4	83.5	66.1
1944	87.9	83.8	133.6	95.8	70.8
1945	103.7	95.3	151.3	108.4	69.9
1946	94.6*	99.5	130.1	101.9	73.4
1947	91.9	98.2*	145.1	103.4	73.3
1948	82.8	76.2	139.1	91.1	59.7
1949	72.0	65.1	140.1	84.1	54.2
1950	54.9	66.8	113.8*	70.8	56.0
1951	68.1	68.0	99.3	74.5	64.1
1952†	80.0	88.5	77.2	82.0	69.9
1953	76.7	70.9	71.2	73.8	68.2
1954	55.9	52.8	50.8	54.1	67.1

Source: Mine Accident Prevention Association of Ontario.

\*Denotes year in which local "Safety Group" began.

†Data since 1952 made consistent with earlier years by adjusting for re-definition of waiting period.

From all Class 5 mines, annual statistics show a gradual decrease in the incidence of compensable accidents from about 126 per thousand men employed in 1920-24 to about 65 in 1950-54. For gold mining as such, statistics are available only from 1938, and because of a broad, high peak based on the interval 1942-49, no precise trend can be drawn. The causes of this peak may be found partly in the growing proportion of inexperienced labour during the war and in the early postwar years; partly in the loss of engineer-supervisors to the armed services; and partly as a function of newer problems which arose with the sharp growth of mechanization. For the past seven years, however, all years but two have shown successive declines, comparable incidence rates in 1947 and 1954 being 103.4 and 54.1, respectively.

On an industry-wide basis, organized accident-prevention began in 1931 with the formation of the Mines Accident Prevention Association under the organization of, and subsidiary to, the Ontario Mining Association, with representation from all operating mines of Class 5, as well as liaison with the Inspection Branch of the Ontario Department of Mines. The Association, under its executive and full-time Safety Director, works closely with the Workmen's Compensation Board in engineering and field aspects of silicosis prevention and in statistical analysis of accidents. The association maintains constant contact with corresponding bodies in all parts of the world on theoretical and practical aspects of accident prevention, and the benefits of its various liaisons and activities are passed in various ways to the member companies who share in its support.

For many years the larger mining companies have followed the practice of employing a full-time safety engineer or supervisor, and in recent years there has been a tendency for this practice to spread among more moderately-sized mines. In very recent years the specialized experience of these men, as well as that of the supervisory staffs of the smaller gold mines, has been organized on a camp-by-camp basis under the auspices of the Association, and it is here that the benefits of concerted effort are most readily apparent in the statistics of incidence. It also encourages hope that the present decline in the incidence may continue.

Within mines there is a wide and growing practice of education among workmen and supervisory staffs alike. Among more formal means designed to inculcate general principles and awareness, past and current accidents are examined clinically with a view to preventing repetition. In all studies having to do with the development of methods for the avoidance of accidents, every attempt is made to anticipate and control the new hazards as they arise from increasing mechanization.



## Nature of the Labour Force in Ontario Gold Mines

In an effort to throw light on the reasons for the lag in the postwar increase in wages in gold mining behind rates in other mining, the Committee obtained from the gold mines data on the place of birth, age, length of service, and marital status of their employees. The returns on which the following comments are based covered 95% of the 11,537 persons employed in Ontario gold mines in 1954.

### Place of birth (Table 1)

Immigrants made up 25% of the national labour force in the census year 1951. In 1954, 30% of the employees of all mines in Ontario were immigrants; in gold mining 42% were immigrants. Of the immigrant employees of gold mines, 29% were from eastern Europe and 20% from the British Isles. One-quarter of these immigrant miners have come to the mines since 1950 and one-third since 1945. The proportion of immigrants is higher in the gold mines in northwestern Ontario. Of the Canadian-born at work in the gold mines, a large proportion is French-speaking.

### Age: (Table 2)

Though the average gold miner is not much older than the average member of the national labour force, he is older than the average employee in all metal mines. Of all gold miners, 35% are 45 or more years of age. In the older camps the percentage is higher (40% in Porcupine-Kirkland Lake) but in the newer camps the proportion is small (15% in Larder Lake and Red Lake).

### Length of Service (Table 3)

Miners with ten or more years service in the reporting gold mines form 30% of the total number of employees. In the older camps the proportion is above this average and, in the new camps, below it. It does not follow, however, that the turnover of labour is lowest in the older camps where the number of long-service men is relatively great. There, some 15% of all employees have been on the payroll of each reporting company less than one year; in the newer camps the proportion is but half that great.

### Marital Status (Table 4)

The proportion of married men in the gold mines (77%) is greater than in all metal mining or in the national labour force. Again, the proportion is higher in the old camps, 80% in Porcupine-Kirkland Lake and 60-75% in other camps.

These returns show clearly that there is in the gold mines a relatively large proportion of older, married men with long periods of employment by particular mining companies, and of recently-arrived immigrants. Neither of these groups is in a strong bargaining position, the older group because its members do not want to move at all, the immigrant group because many of its members have no intention of staying beyond the time when language and other difficulties of adjustment in the new country compel it. Together with the young men who grow up in the mining towns, the immigrants make up the "high-turnover" portion of the labour force of the gold mines. The existence in this labour force of a large supply of men unwilling or as yet unready to move does not favour vigorous action to raise wages.

APPENDIX X: TABLE 1

MALE EMPLOYEES OF ONTARIO GOLD MINES (1954) BY PLACE OF BIRTH  
COMPARED WITH MALE EMPLOYEES OF ALL ONTARIO METAL MINES

	Porcupine		Kirkland Lake		Larder Lake		Red L. - Pickle L.		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>MINES REPORTING..</b>	10	...	7	...	1	...	5	...	4	...	27	...
<b>MEN REPORTED.....</b>	6,135	100.0	2,349	100.0	1,110	100.0	848	100.0	649	100.0	11,091	100.0
<b>Canadian Born.....</b>	3,556	58.0	1,312	55.9	683	61.5	372	43.9	450	69.3	6,373	57.5
French Speaking.....	942	15.4	275	11.7	275	24.8	42	5.0	89	13.7	1,623	14.6
English Speaking.....	2,614	42.6	1,037	44.1	408	36.8	330	38.9	361	55.6	4,750	42.8
<b>Immigrants.....</b>	2,579	42.0	1,037	44.1	427	38.5	476	56.1	199	30.7	4,718	42.5
British Isles.....	598	9.7	241	10.3	36	3.2	54	6.4	27	4.2	956	8.6
East and So. Europe	1,728	28.2	721	30.7	287	25.6	265	31.3	125	19.3	3,126	28.2
Immigrants since 1945....	452	14.0	342	16.3	328	29.5	95	22.8	82	12.6	1,299	17.9
Immigrants since 1950....	305	9.4	184	9.7	148	13.3	78	18.7	66	10.2	781	10.8

Source: As reported by the gold mines to the committee



APPENDIX X: TABLE 2

AGE DISTRIBUTION OF MALE EMPLOYEES OF ONTARIO  
GOLD MINES, 1954

Age Group:	Total			Porcupine		
	No.	%	Cum. %	No.	%	Cum. %
19 and under	185	1.7	1.7	58	1.0	1.0
20-24	1,053	9.6	11.3	520	8.6	9.6
25-34	3,064	27.9	39.2	1,619	26.7	36.3
35-44	2,801	25.5	64.7	1,513	25.0	61.3
45-54	2,451	22.3	87.0	1,402	23.2	84.5
55-59	798	7.3	94.3	512	8.5	93.0
60-64	390	3.5	97.8	262	4.3	97.3
65 and over	246	2.2	100.0	168	2.8	100.1
TOTAL	10,988	100.0		6,054	100.0	
Number of Mines Reporting	27			10		

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	Kirkland Lake			Larder Lake		
	No.	%	Cum. %	No.	%	Cum. %
19 and under	48	2.0	2.0	32	2.9	2.9
20-24	149	6.4	8.4	179	16.1	19.0
25-34	545	23.2	31.6	399	35.9	54.9
35-44	590	25.2	56.8	323	30.9	84.0
45-54	640	27.3	84.1	152	13.7	97.7
55-59	218	9.3	93.4	18	1.6	99.3
60-64	99	4.2	97.6	4	0.4	99.7
65 and over	56	2.4	100.0	3	0.3	100.0
TOTAL	2,345	100.0	...	1,110	100.0	...
Number of Mines Reporting	7			1		

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	Red. L.-Pickle L.			Other		
	No.	%	Cum. %	No.	%	Cum. %
19 and under	22	2.6	2.6	25	3.9	3.9
20-24	129	15.4	18.0	76	11.8	15.7
25-34	344	41.2	59.2	157	24.4	40.1
35-44	209	25.0	84.2	166	25.8	65.9
45-54	92	11.0	95.2	165	25.6	91.5
55-59	22	2.6	97.8	28	4.3	95.8
60-64	8	1.0	98.8	17	2.6	98.4
65 and over	9	1.1	99.9	10	1.6	100.0
TOTAL	835	100.0	...	644	100.0	...
Number of Mines Reporting	5			4		

Source: As reported by the gold mines to the Committee.

APPENDIX X: TABLE 3

MALE EMPLOYEES IN ONTARIO GOLD MINES  
YEARS OF SERVICE WITH PRESENT COMPANY

	Total			Porcupine		
	No.	%	Cum. %	No.	%	Cum. %
Mines Reporting	27			10		
Length of Service:						
20 years and over	1,540	13.9	13.9	1,077	17.6	17.6
15-19 years	726	6.6	20.5	379	6.2	23.8
10-14 years	1,176	10.6	31.1	668	10.9	34.7
5-9 years	2,111	19.1	50.2	1,242	20.3	55.0
1-4 years	3,854	34.8	85.0	2,033	33.2	88.2
Less than 1 year	1,672	15.1	100.1	728	11.9	100.1
TOTAL	11,079	100.0	...	6,127	100.0	...
Labour Turnover						
Men hired in past 12 months	3,266	...	...	1,319		
As % of men employed less than one year	195.2			181.2		

	Kirkland Lake			Larder Lake		
	No.	%	Cum. %	No.	%	Cum. %
Mines Reporting	7			1		
Length of Service:						
20 years and over	453	19.3	19.3	...	...	...
15-19 years	228	9.7	29.0	42	3.8	3.8
10-14 years	350	14.9	43.9	75	6.8	10.6
5-9 years	440	18.8	62.7	214	19.3	29.9
1-4 years	661	28.2	90.9	468	42.2	72.1
Less than 1 year	213	9.1	100.0	311	28.0	100.0
TOTAL	2,345	100.0	...	1,110	100.0	...
Labour Turnover						
Men hired in past 12 months	425			547		
As % of men employed less than one year	199.5			175.8		

	Red L- Pickle L			Other		
	No.	%	Cum. %	No.	%	Cum. %
Mines Reporting	5			4		
Length of Service:						
20 years and over	3	0.4	0.4	7	1.1	1.1
15-19 years	16	1.9	2.3	61	9.5	10.6
10-14 years	15	1.8	4.1	68	10.6	21.2
5-9 years	110	12.9	17.0	105	16.3	37.5
1-4 years	427	50.1	67.1	265	41.1	78.6
Less than 1 year	282	33.0	100.0	138	21.4	100.0
TOTAL	853	100.0		644	100.0	
Labour Turnover						
Men hired in past 12 months	608			367		
As % of men employed less than one year	215.6			265.9		

Source: As reported by the gold mines to the Committee.

APPENDIX X: TABLE 4

DISTRIBUTION OF MALE EMPLOYEES OF ONTARIO GOLD MINES, 1954, BY MARITAL STATUS  
AND AVERAGE NUMBER OF DEPENDENTS PER MARRIED EMPLOYEE

	Porcupine		Kirkland Lake		Larder Lake		Red L. - Pickle L.		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mines Reporting.....	10	...	7	...	1	...	5	...	...	...	27	...
Total Men Reported.....	6,133	100.0	2,345	100.0	1,110	100.0	853	100.1	649	100.0	11,090	100.0
Single.....	1,189	19.4	352	15.0	338	30.5	325	38.1	193	29.7	2,397	21.6
Married.....	4,854	79.1	1,947	83.0	768	69.1	516	60.5	445	68.6	7,530	76.9
Widowed.....	77	1.3	37	1.6	4	0.4	9	1.1	8	1.2	135	1.2
Divorced.....	13	0.2	9	0.4	...	...	3	0.4	3	.5	28	0.3
Dependents:												
Number.....	12,264	...	4,666	...	1,666	...	1,049	...	936	...	20,581	...
Average per married man	2.5	...	2.4	...	2.2	...	2.3	...	2.2	...	2.4	...

Source: As reported by the gold mines to the Committee.



**Method of Measuring the Impact of Wages, Hours Changes**

The calculations of the effects on employment of higher wages and shorter hours in the gold mines are based upon the following information made available to the Committee by the Employment Section, Dominion Bureau of Statistics, Ottawa:

APPENDIX XI: TABLE 1

**HOURS AND EARNINGS**

	ONTARIO GOLD MINES	ONTARIO OTHER METAL MINING "Sudbury"	TORONTO IRON AND STEEL PRODUCTS "Toronto"
<b>Average Hours Per Week</b>			
1952	45.8	40.4	40.7
1953	45.5	40.5	40.9
1954	45.4	40.3	40.4
<b>Average Hourly Earnings</b>			
1952	\$1.287	\$1.756	\$1.501
1953	1.304	1.862	1.566
1954	1.350	1.919	1.615

As an example, in 1952 to reduce the work week from the "gold mines" hours to the "Sudbury" level would have increased the labour cost to gold mines by an average of 13%. The assumption is made that wage rates are raised to compensate for the shorter hours, so that take-home pay per week remains the same. To reduce the work week from 45.8 hours ("gold mines") to 40.4 hours ("Sudbury") would increase labour costs in each mine by 45.8/40.4 or 1.133 times, or roughly 13%.

This 13% does not allow for changes in productivity. It is possible that upsetting the present routine of drilling and blasting on present shifts would lead to lower productivity. But it is also possible, that shorter hours might mean greater productivity. The effects of changes in hours on productivity are here ignored.

Similarly, to increase hourly earnings in 1952 from \$1.287 ("gold mines") to \$1.756 ("Sudbury") would raise labour costs by  $1.756/1.287$  or 1.364 times, or roughly 36%.

To shorten the work week and to raise the pay, so that gold miners would have the same conditions as other metal miners in Ontario would cost in 1952 an average 54% more for the labour in each gold mine. The Toronto iron and steel products situation would cost roughly 31% more.

Under 1954 conditions, "Sudbury" wages and hours would increase the wages bill of the gold mines by 60%; "Toronto" wages and hours would involve an increase of 34%.

Increases such as these would close some gold mines. To calculate the impact, a mine-by-mine estimation was made by the Committee. The actual wages bills for each of the two years were taken, and were increased by the various percentages. These increases were then balanced against the existing excesses (if any) of total revenue from gold production over total variable costs (wages, salaries, costs of supplies, power). That is, where the increased labour costs more than wiped out any excess in revenue over existing operating costs, the mines would be in serious difficulty.

Could the mines adjust to tighter circumstances? With its knowledge of grades mined, of ore availability and of grades of reserves, the Committee made evaluations as to whether or not, and how big, an adjustment was possible for each mine. The evaluations form the basis of the conclusions stated in chapter 5 as to the effects upon employment of higher wages and shorter hours in Ontario gold mines.

## **tables**





TABLE 1

## ONTARIO GOLD PRODUCTION BY CAMPS

	TO END OF 1954		1954	
	Ounces Produced	% Ontario Total	Ounces Produced	% Ontario Total
Porcupine	37,509,819	53.63	1,039,715	45.05
Kirkland Lake	19,583,344	28.00	392,612	17.01
Larder Lake	3,509,219	5.02	355,746	15.41
Patricia	4,859,293	6.95	350,891	15.20
Thunder Bay	2,720,632	3.89	95,562	4.14
All Others	1,765,367	2.52	73,625	3.19
	69,947,674	100.00	2,308,151	100.00

Source: Ontario Department of Mines, Statistical Branch.

TABLE 2  
GOLD PRODUCTION, 1891-1954

Year	CANADA TOTAL		ONTARIO GOLD MINES*				Grade in Ounces Per Ton
	Ounces	Dollars	Ounces	Dollars	Tons Milled		
1886	70,782	1,463,196	...	...	...	...	
1887	57,460	1,187,804	...	...	...	...	
1888	53,145	1,098,610	...	...	...	...	
1889	62,653	1,295,159	...	...	...	...	
1890	55,620	1,149,776	...	...	...	...	
1891	45,018	930,614	...	2,000	500	...	
1892	43,905	907,601	...	6,730	1,400	...	
1893	47,243	976,603	...	30,833	3,102	...	
1894	54,600	1,128,688	764	32,777	5,280	...	
1895	100,798	2,083,674	725	57,322	5,531	...	
1896	133,262	2,754,774	228	121,929	11,898	...	
1897	291,557	6,027,016	9,065	193,243	28,666	...	
1898	666,386	13,775,420	14,177	265,003	52,370	...	
1899	1,028,529	21,261,584	27,620	425,548	59,415	...	
1900	1,350,057	27,908,153	18,768	298,061	45,842	...	
1901	1,167,216	24,128,503	14,298	244,438	53,361	...	
1902	1,032,161	21,336,667	8,636	229,839	47,555	...	
1903	911,559	18,843,590	5,935	185,807	34,297	...	
1904	796,374	16,462,517	883	16,136	2,648	...	
1905	684,951	14,159,195	5,429	100,612	17,713	...	
1906	556,415	11,502,120	3,442	66,389	10,359	...	
1907	405,517	8,382,780	3,821	66,560	13,107	...	
1908	476,112	9,842,105	3,475	60,298	9,719	...	
1909	453,865	9,382,230	2,051	32,745	6,500	...	
1910	493,707	10,205,835	3,619	68,618	5,484	...	

TABLE 2 (Continued)

## GOLD PRODUCTION, 1891—1954

Year	CANADA TOTAL		ONTARIO GOLD MINES				Grade in Ounces Per Ton
	Ounces	Dollars	Ounces	Dollars	Tons Milled		
1911	473,159	9,781,077	2,185	42,685	3,852	.567	
1912	611,885	12,648,794	86,603	1,817,987	156,072	.555	
1913	802,973	16,598,923	220,625	4,579,477	365,246	.604	
1914	773,178	15,983,007	268,203	5,574,733	604,390	.444	
1915	918,056	18,977,901	407,128	8,448,260	929,922	.438	
1916	930,492	19,234,976	497,525	10,392,998	1,393,751	.357	
1917	738,831	15,272,992	420,796	8,757,758	1,230,321	.342	
1918	699,681	14,463,689	411,548	8,567,051	875,593	.470	
1919	766,764	15,850,423	504,995	10,533,928	1,134,271	.445	
1920	765,007	15,814,098	564,442	13,140,826	1,258,233	.449	
1921	926,329	19,148,920	708,033	16,072,947	1,717,339	.412	
1922	1,263,364	26,116,050	993,756	20,856,913	2,268,736	.438	
1923	1,233,341	25,495,421	970,647	20,446,577	2,254,465	.431	
1924	1,525,382	31,532,443	1,237,492	25,926,403	2,868,073	.431	
1925	1,735,735	35,880,826	1,457,095	30,241,565	3,398,973	.429	
1926	1,754,228	36,263,110	1,492,760	31,008,507	3,692,482	.404	
1927	1,852,785	38,300,464	1,622,126	33,733,087	4,286,553	.378	
1928	1,890,592	39,082,005	1,574,365	32,691,630	4,224,154	.373	
1929	1,928,308	39,861,663	1,613,335	33,647,047	3,965,105	.407	
1930	2,102,068	43,453,601	1,712,154	35,539,945	3,945,223	.434	
1931	2,693,892	58,093,396	2,062,420	44,636,584	5,025,725	.410	
1932	3,044,387	71,479,373	2,264,708	53,067,341	5,497,086	.412	
1933	2,949,309	84,350,237	2,118,622	60,124,361	5,621,517	.377	
1934	2,972,074	102,536,553	2,044,963	70,929,796	6,413,010	.319	
1935	3,284,890	115,595,279	2,151,224	75,921,744	7,033,874	.306	



TABLE 2 (Concluded)

## GOLD PRODUCTION, 1891-1954

Year	CANADA TOTAL		ONTARIO GOLD MINES				Grade in Ounces Per Ton
	Ounces	Dollars	Ounces	Dollars	Tons Milled		
1936	3,748,028	131,293,421	2,316,181	80,951,954	7,747,413	.299	
1937	4,096,213	143,326,493	2,511,640	88,095,110	8,426,898	.298	
1938	4,725,117	166,205,990	2,816,250	99,351,493	9,583,590	.294	
1939	5,094,379	184,115,951	3,008,894	109,605,813	10,723,129	.281	
1940	5,311,145	204,479,083	3,170,823	122,625,982	11,768,273	.269	
1941	5,345,179	205,789,392	3,115,973	120,625,747	12,225,234	.255	
1942	4,841,306	186,390,281	2,692,831	104,229,605	10,650,150	.253	
1943	3,651,301	140,575,088	2,061,375	79,739,273	8,069,363	.255	
1944	2,922,911	112,532,073	1,676,532	64,803,009	6,800,568	.247	
1945	2,696,727	103,823,990	1,533,998	59,498,969	6,277,436	.244	
1946	2,832,554	104,096,359	1,761,846	65,262,779	7,264,483	.243	
1947	3,070,221	107,457,735	1,900,747	66,939,025	7,677,742	.248	
1948	3,529,608	123,536,280	2,055,668	72,567,139	8,538,543	.241	
1949	4,123,518	148,446,648	2,318,763	84,285,029	9,868,317	.235	
1950	4,441,227	168,988,687	2,444,842	93,172,812	10,288,611	.238	
1951	4,392,751	161,872,873	2,422,504	90,020,085	10,205,570	.237	
1952	4,471,725	153,246,016	2,469,793	86,372,277	9,999,455	.247	
1953	4,055,723	139,597,985	2,142,464	74,311,624	8,643,652	.248	
1954	4,366,506	148,764,611	2,315,213	79,210,802	9,369,894	.249	

Source: Ontario Department of Mines, Statistical Branch.

\*Not reported before 1891.

TABLE 3a

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Ontario Total	Southeastern Ontario	Sudbury	Algoma
1895	389	...	...	...
1896	...	...	...	...
1897	9,065	1,325	220	...
1898	14,177	1,800	86	...
1899	27,620	5,314	...	...
1900	18,768	4,199	...	52
1901	14,298	7,054	...	...
1902	8,636	5,788	...	300
1903	5,935	4,579	...	...
1904	647	249	...	18
1905	5,429	368	1,723	...
1906	3,442	8	...	...
1907	3,821	7	339	...
1908	3,475	302	81	1,262
1909	2,051	26	...	...
1910	3,619	162	898	340
1911	2,185	...	475	32
1912	86,603	772	...	...
1913	220,625	1,065	5,879	...
1914	268,203	127	11,910	...
1915	407,128	193	13,656	...
1916	497,525	...	9,230	...
1917	420,796	29	...	...
1918	411,548	...	...	...
1919	504,995	15	...	...
1920	564,442	...	...	...
1921	708,033	...	...	...
1922	993,756	50	...	...
1923	970,647	...	...	7
1924	1,237,492	...	...	...
1925	1,457,095	...	...	2
1926	1,492,760	...	...	88
1927	1,622,126	...	...	...
1928	1,574,365	...	...	...
1929	1,613,335	...	...	397
1930	1,712,154	...	...	152

TABLE 3a (Concluded)

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Ontario Total	Southeastern Ontario	Sudbury	Algoma
1931	2,062,420	...	...	6,846
1932	2,264,708	...	168	15,022
1933	2,118,622	...	...	15,753
1934	2,044,963	...	1,995	14,040
1935	2,151,224	...	7,824	17,172
1936	2,316,181	...	2,303	22,679
1937	2,511,640	7	11,468	16,740
1938	2,816,250	...	21,027	16,210
1939	3,008,894	379	18,267	24,936
1940	3,170,823	3,108	11,489	16,704
1941	3,115,973	60	12,197	11,565
1942	2,692,831	...	29,481	8,905
1943	2,061,375	...	18,646	426
1944	1,676,532	...	50	39
1945	1,533,998	...	10	40
1946	1,761,846	...	...	...
1947	1,900,747	...	4,778	77
1948	2,055,668	...	24,120	18
1949	2,318,763	...	32,725	...
1950	2,444,842	...	36,931	...
1951	2,422,504	...	23,717	...
1952	2,469,793	...	40,838	179
1953	2,142,464	...	41,264	227
1954	2,315,213	...	42,728	...

Source: Ontario Department of Mines, Statistical Branch.

TABLE 3b

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Thunder Bay	Matachewan	Rainy River	Kenora
1895	...	...	336	389
1896	...	...	228	...
1897	112	...	1,035	6,373
1898	...	...	1,357	10,934
1899	...	...	9,130	12,666
1900	...	...	3,203	10,828
1901	...	...	110	6,735
1902	...	...	...	2,200
1903	...	...	...	1,356
1904	...	...	236	380
1905	1,787	...	...	1,551
1906	1,220	...	...	2,214
1907	524	...	...	2,951
1908	...	...	...	1,830
1909	...	...	...	2,025
1910	...	...	...	258
1911	207	...	...	370
1912	1,950	...	...	156
1913	987	...	20	...
1914	...	...	...	...
1915	...	...	...	28
1916	...	...	...	6
1917	94	...	...	14
1918	1,460	...	...	10
1919	...	...	10	...
1920	423	...	5	101
1921	297	...	...	...
1922	...	47	...	...
1923	83	...	...	145
1924	4	...	...	...
1925	...	...	...	103
1926	...	...	...	4
1927	...	...	...	...
1928	...	...	...	...
1929	115	...	12	43
1930	22	...	...	16



TABLE 3b (Concluded)

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Thunder Bay	Matachewan	Rainy River	Kenora
1931	15	...	...	186
1932	8,621	2,960	...	187
1933	8,903	16,991	154	...
1934	18,588	17,738	353	65
1935	63,611	42,750	18	2,798
1936	90,004	50,022	3	10,791
1937	108,148	52,351	50	7,786
1938	195,895	58,699	23	10,686
1939	239,502	71,099	...	19,056
1940	266,959	70,497	169	14,790
1941	242,649	69,870	331	17,848
1942	219,398	63,019	682	11,844
1943	141,666	38,721	...	1,546
1944	100,827	28,635	...	...
1945	49,829	35,087	...	25
1946	106,731	42,726	...	...
1947	117,328	52,175	...	232
1948	112,341	48,959	10	1
1949	117,864	49,526	29	65
1950	131,413	50,048	...	...
1951	137,290	41,984	28	9
1952	120,052	40,144	40	...
1953	113,713	31,173	...	...
1954	96,365	30,671	2	...

Source: Ontario Department of Mines, Statistical Branch.

TABLE 3c

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Porcupine	Kirkland Lake	Patricia Portion	Larder Lake	Miscellaneous
1895	...	...	...	...	...
1896	...	...	...	...	...
1897	...	...	...	...	...
1898	...	...	...	...	...
1899	...	...	...	...	510
1900	...	...	...	...	486
1901	...	...	...	...	399
1902	...	...	...	...	348
1903	...	...	...	...	...
1904	...	...	...	...	...
1905	...	...	...	...	...
1906	...	...	...	...	...
1907	...	...	...	...	...
1908	...	...	...	...	...
1909	...	...	...	...	...
1910	1,947	14	...	...	...
1911	765	266	3	67	...
1912	83,725	...	...	...	...
1913	207,748	4,226	...	700	...
1914	250,642	5,524	...	...	...
1915	366,593	26,658	...	...	...
1916	454,298	33,991	...	...	...
1917	401,094	19,565	...	...	...
1918	378,959	30,575	...	544	...
1919	481,318	23,527	...	125	...
1920	512,625	49,997	...	1,291	...
1921	633,938	73,773	...	25	...
1922	888,953	104,706	...	...	...
1923	838,825	128,082	...	3,499	6
1924	1,070,747	159,385	6	7,350	...
1925	1,196,364	247,517	...	13,109	...
1926	1,145,592	335,883	...	11,088	105
1927	1,154,119	451,672	...	16,335	...
1928	980,982	584,968	...	8,415	...
1929	932,733	671,724	511	7,800	...
1930	859,084	820,128	22,147	10,605	...

TABLE 3c (Concluded)

**ONTARIO GOLD PRODUCTION BY CAMPS, 1895-1954**  
(Fine Ounces)

Year	Porcupine	Kirkland Lake	Patricia Portion	Larder Lake	Miscellaneous
1931	962,253	1,040,529	41,702	10,889	...
1932	1,036,293	1,139,727	53,948	7,782	...
1933	1,046,182	987,109	40,596	2,934	...
1934	949,798	983,592	54,340	4,454	...
1935	968,545	943,922	100,307	4,213	64
1936	1,023,352	951,752	148,535	16,681	59
1937	1,120,476	977,977	195,099	21,516	25
1938	1,258,671	972,770	224,089	58,058	119
1939	1,312,690	941,371	287,921	93,397	276
1940	1,425,710	875,984	337,084	148,123	206
1941	1,439,151	743,525	372,727	205,856	194
1942	1,308,591	541,527	294,103	214,860	421
1943	1,020,976	466,099	203,963	169,292	40
1944	873,064	383,239	175,658	115,020	...
1945	830,909	369,992	138,752	109,354	...
1946	904,977	403,739	158,122	145,551	...
1947	937,068	438,936	161,994	188,159	...
1948	998,884	447,889	219,204	204,177	65
1949	1,047,949	475,821	280,348	314,433	3
1950	1,100,121	448,392	336,854	341,083	...
1951	1,062,951	454,986	349,404	352,135	...
1952	1,163,343	417,382	321,763	366,052	...
1953	876,814	404,903	340,113	334,247	10
1954	1,038,919	392,787	350,576	363,139	24

Source: Ontario Department of Mines, Statistical Branch.

TABLE 4

**ONTARIO GOLD MINES**  
**YEARS IN PRODUCTION, 1897-1954**  
(with production exceeding \$50,000 in the years listed)

**Southeastern Ontario:**

Cordova, 1901-1903, 1940

Deloro, 1899, 1901

**Rainy River:**

Golden Star, 1899

**Kenora:**

Sultana, 1896, 1898-99

Regina, 1902, 1941

Mikado, 1898-1900

Cedar Island, 1936

Cameron Island, 1935-36

Sakoose, 1901

Wendigo, 1936-42

Big Master, 1902-03, 1905, 1942-43

Laurentian, 1907

Straw Lake Beach, 1939-41

Kenricia, 1939

**Porcupine:**

Hollinger, 1912-54

Dome, 1912-54

Vipond, 1914-18, 1924-39, 1941

McIntyre-Porcupine 1912-54

Porcupine Crown, 1913-18, 1920

Coniaurum, 1914, 1928-54

Dome Lake and West Dome Lake, 1915, 1918, 1920, 1924-27, 1929

Munro Croesus, 1915-18

Schumacher, 1916-18



TABLE 4 (Continued)

Night Hawk, 1924-26  
 Buffalo Ankerite, 1926-29, 1932-53  
 Gillies Lake, 1930, 1935-37  
 Marbuan, 1928-32, 1934-35  
 De Santis, 1939-42  
 Naybob, 1939-42  
 Paymaster, 1926-28, 1934-54  
 Pamour, 1936-54  
 Ross, 1936-54  
 Delnite, 1937-54  
 Hallnor, 1938-54  
 Moneta, 1938-43  
 Preston East Dome, 1938-54  
 Broulan Reef, 1939-54  
 Faymar, 1940-42  
 Aunor, 1940-54  
 Nakhodas, 1941-42  
 Bonetal, 1942-51  
 Hoyle, 1941-43, 1946-48  
 \*Bonwhit, 1951-54  
 Hugh-Pam, 1952-54

**Kirkland Lake:**

Toburn, 1913-18, 1922, 1925-28, 1932-52  
 Kirkland Golden Gate, 1938-42  
 Wright-Hargreaves, 1921-54  
 Teck-Hughes, 1917-54  
 Lake Shore, 1918-54  
 Kirkland Lake Gold, 1919-23, 1926-54  
 Sylvanite, 1927-54  
 Macassa, 1933-54  
 Moffat Hall, 1934-35  
 Bidgood, 1936-49  
 Morris Kirkland, 1937-38, 1940-41  
 Upper Canada, 1938-54

TABLE 4 (Continued)

**Sudbury:**

Long Lake, 1913-16, 1937-39  
McMillan, 1934-35  
New Golden Rose, 1937-41  
Bousquet, 1936-37  
Tionaga, 1939  
Jerome, 1941-43  
Renabie, 1947-54

**Patricia:**

Howey, 1930-41  
Central Patricia, 1934-51  
J-M Consolidated, 1936-40  
New Jason, 1936-37, 1940-42, 1946-47, 1949-52  
Pickle Crow, 1935-54  
McKenzie Red Lake, 1935-54  
Red Lake Gold Shore, 1936-37, 1939  
Hudson Patricia, 1936  
Gold Eagle, 1937-41  
Sachigo River, 1938-41  
Madsen Red Lake, 1938-54  
Hasaga, 1939-52  
Uchi, 1939-43  
Berens River, 1939-48  
Cochenour Willans, 1939-54  
McMarmac Red Lake, 1940-44, 1947-48  
New Dickenson, 1949-54  
Starratt Olsen, 1948-54  
Campbell Red Lake, 1949-54

**Matachewan:**

Young-Davidson, 1934-54  
Tyranite, 1939-42  
Matachewan Consolidated, 1935-53  
Ashley, 1932-36  
Ronda, 1939

TABLE 4 (Concluded)

**Algoma:**

Darwin, 1936-37  
Minto, Jubilee and Cooper, 1931-36, 1938-39  
Parkhill, 1931-37  
Algoma-Summit, 1937-38  
Cline Lake, 1938-42  
Alden Goudreau, 1942

**Thunder Bay:**

St. Anthony, 1912, 1934-41  
Tashota, 1935-37  
Ardeen, 1932-34, 1936  
Northern Empire, 1934-41  
Little Long Lac, 1934-53  
Sturgeon River, 1937-42  
Leitch, 1937-54  
Bankfield, 1937-42  
Sand River, 1938-42  
MacLeod-Cockshutt, 1938-54  
Hard Rock, 1938-51  
Tombill, 1938-42  
Magnet, 1938-43, 1946-51  
Jellicoe, 1940  
Theresa, 1952

**Larder Lake:**

Omega, 1936-47  
Argonaut, 1923-27  
Kerr-Addison, 1938-54  
Barry Hollinger, 1925-35  
Raven River, 1938-39  
Chesterville, 1939-52  
Cathroy-Larder, 1942

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\* Bonwhit absorbed by Broulan Reef, 1954.  
Source: Ontario Department of Mines, Statistical Branch.

TABLE 5

**WAR AND POSTWAR TRENDS 1939-1954**  
**TORONTO STOCK EXCHANGE INDEX\***  
**20 GOLD STOCKS**  
 (Quarterly Closes)

1939 Mar. 114	1945 Mar. 117	1950 Mar. 101
June 116	June 126	June 87
Sept. 105	Sept. 130	Sept. 81
Dec. 122	Dec. 143	Dec. 75
1940 Mar. 112	1946 Mar. 133	1951 Mar. 85
June 79	June 121	June 78
Sept. 98	Sept. 94	Sept. 85
Dec. 108	Dec. 106	Dec. 85
1941 Mar. 104	1947 Mar. 108	1952 Mar. 88
June 98	June 109	June 90
Sept. 100	Sept. 116	Sept. 89
Dec. 83	Dec. 104	Dec. 85
1942 Mar. 66	1948 Mar. 94	1953 Mar. 78
June 66	June 85	June 77
Sept. 58	Sept. 88	Sept. 69
Dec. 71	Dec. 91	Dec. 68
1943 Mar. 82	1949 Mar. 94	1954 Mar. 74
June 84	June 97	June 74
Sept. 99	Sept. 103	Sept. 78
Dec. 99	Dec. 105	Dec. 82
1944 Mar. 102		
June 110		
Sept. 112		
Dec. 108		

\* Mean of second-half 1933=100.

TABLE 6

**CAPITAL INVESTMENT IN ONTARIO GOLD MINES, 1939-1952\***

Year	Amount	Year	Amount
1939.....	\$7,205,166	1946.....	\$2,605,822
1940.....	5,880,015	1947.....	4,315,849
1941.....	5,463,224	1948.....	5,623,623
1942.....	2,158,273	1949.....	4,424,196
1943.....	596,159	1950.....	3,431,625
1944.....	677,113	1951.....	3,002,417
1945.....	1,084,243	1952.....	2,957,884

\*Investment in Mines and Mills.



TABLE 7

# **ONTARIO GOLD MINES** **PRODUCTION, OPERATING PROFITS AND DIVIDENDS, 1912-1954**

Year	Profits from Mine Operations *	Dividends Paid	Value of Production	Profits from Mine Operations % Value Total Production	Dividends as % Value Total Production
1912	...	\$ 270,000.00	\$ 1,817,987	...	14.9
1913	...	1,170,000.00	4,579,477	...	25.5
1914	...	1,410,000.00	5,574,733	...	25.3
1915	...	2,344,875.00	8,448,260	...	27.8
1916	...	4,591,750.00	10,392,998	...	44.2
1917	...	1,699,542.45	8,757,758	...	19.4
1918	...	1,873,042.45	8,567,051	...	21.9
1919	...	2,186,028.30	10,533,928	...	20.8
1920	...	3,256,928.45	13,140,826	...	24.8
1921	...	4,342,990.20	16,072,947	...	27.0
1922	...	5,430,513.56	20,856,913	...	26.0
1923	...	5,552,521.54	20,446,577	...	27.2
1924	...	6,473,972.00	25,926,403	...	25.0
1925	...	8,233,842.06	30,241,565	...	27.2
1926	...	10,879,137.63	31,008,507	...	35.1
1927	...	11,804,644.33	33,733,087	...	35.0
1928	...	12,849,399.69	32,691,630	...	39.3
1929	...	10,021,855.94	33,647,042	...	29.8
1930	...	11,133,703.91	35,539,945	...	31.3
1931	...	14,102,720.47	44,636,584	...	31.6
1932	...	16,157,174.00	53,067,341	...	30.4
1933	...	18,134,119.19	60,124,361	...	30.2
1934	...	26,361,863.30	70,929,796	...	37.2
1935	...	24,951,166.07	75,921,744	...	32.9
1936	37,383,000	29,664,371.46	80,951,954	46.2	36.6
1937	38,699,000	35,144,429.12	88,095,110	43.9	39.9
1938	41,532,000	32,164,136.48	99,351,493	41.8	32.4
1939	46,489,000	33,804,508.30	109,605,813	42.4	30.8
1940	49,923,000	34,841,614.57	122,625,982	40.7	28.4
1941	46,640,000	35,550,871.01	120,625,747	38.7	21.2
1942	37,545,000	25,940,061.85	104,229,605	36.0	24.9
1943	29,067,000	22,542,160.43	79,739,273	36.5	28.3
1944	18,980,000	19,544,228.13	64,803,009	29.3	30.2
1945	16,057,000	16,694,416.41	59,498,969	27.0	28.1
1946	14,532,000	15,665,778.59	65,262,779	22.3	24.0
1947	12,014,000	12,959,413.46	66,939,025	17.9	19.4
1948	17,892,000	12,315,171.72	72,567,139	10.9	17.0
1949	14,945,000	14,983,482.18	84,285,029	17.7	17.8
1950	17,945,000	17,276,091.60	93,172,812	19.3	18.5
1951	14,623,000	15,596,144.88	90,020,085	16.2	17.3
1952	10,585,000	15,463,263.38	86,372,277	12.3	17.9
1953	6,685,000	14,242,485.44	74,311,624	9.0	19.2
1954	...	...	79,210,802	...	...

\*Excluding EGMA.

Source: Ontario Department of Mines, Statistical Branch.

TABLE 8

### ONTARIO GOLD MINES GOLD PRICE AND VARIABLE COSTS

Year	Gold Price Per Ounce	Recovery Per Ton (In Ounces)	Variable Costs Per Ounce	Variable Costs Per Ton	(1932 = 100)	
					Price Per Ounce	Variable Cost Per Ton
1910	\$18.93	\$12.51	...	...	...	...
1911	19.51	11.54	...	...	...	...
1912	20.87	11.64	...	...	...	...
1913	20.64	12.54	...	...	...	...
1914	20.67	9.22	...	...	...	...
1915	20.66	9.08	...	...	...	...
1916	20.67	7.45	...	...	...	...
1917	20.73	7.11	...	...	...	...
1918	20.67	9.78	...	...	...	...
1919	20.58	9.28	...	...	...	...
1920	23.42	10.44	...	...	...	...
1921	22.69	9.34	...	...	...	...
1922	20.88	9.19	...	...	...	...
1923	20.94	9.06	...	...	...	...
1924	20.79	9.03	...	...	...	...
1925	20.67	8.89	...	...	...	...
1926	20.67	8.38	...	...	...	...
1927	20.67	7.86	...	...	...	...
1928	20.67	7.73	...	...	...	...
1929	20.76	8.48	...	...	...	...
1930	20.69	9.01	...	...	...	...
1931	21.57	8.88	...	...	...	...
1932	23.46	9.65	...	...	100.0	100.0
1933	28.94	10.60	...	...	123.4	100.0
1934	34.56	11.06	...	...	147.3	100.7
1935	35.15	10.79	14.10	4.31	149.8	102.6
1936	35.03	10.44	15.60	4.66	149.3	115.7
1937	34.98	10.45	16.34	4.86	149.1	111.0
1938	35.19	10.36	16.72	4.91	150.0	116.9
1939	36.20	10.22	17.62	4.94	154.3	117.6
1940	38.50	10.41	17.46	4.70	164.1	111.9
1941	38.50	9.86	19.03	4.85	164.1	115.5
1942	38.50	9.42	18.88	4.59	164.1	109.3
1943	38.50	9.83	18.83	4.81	164.1	114.5
1944	38.50	9.49	21.04	5.18	164.1	123.3
1945	38.50	9.48	22.16	5.41	164.1	128.8
1946	36.75	8.98	23.37	5.68	156.6	135.2
1947	35.00	8.72	25.04	6.19	149.2	147.4
1948	35.00	8.50	25.87	6.22	149.2	148.1
1949	36.00	8.54	24.67	5.79	153.5	137.9
1950	38.05	9.06	24.41	5.79	162.2	137.9
1951	36.85	8.82	25.77	6.12	157.1	145.7
1952	34.26	8.64	25.63	6.33	146.0	150.7
1953	34.42	8.60	24.94	6.18	146.7	147.1
1954	34.06	8.50	24.40	6.08	145.2	144.8

Source: Ontario Department of Mines and Committee estimates.

TABLE 9  
AVERAGE GRADES OF ORE MINED IN ONTARIO, 1911-1954  
ALL ONTARIO MINES AND BY CAMPS

Year	All Ontario Mines	Porcupine Camp	Kirkland Lake	Larder Lake	Patricia Portion	Thunder Bay	Matachewan	Sudbury
1911	.567	1.771	.394	.298	.100	.383	...	271
1912	.555	.598	...	...	...	.170	...	...
1913	.604	.647	.662	1.458	...	.153	...	.285
1914	.444	.452	1.479	...	...	...	...	.262
1915	.438	.427	1.018	...	...	...	...	.308
1916	.357	.342	.853	...	...	...	...	.344
1917	.342	.340	.392	...	...	...	...	...
1918	.470	.464	.571	.362	...	.405	...	...
1919	.445	.440	.577	.170	...	...	...	...
1920	.449	.441	.548	.278	...	...	...	...
1921	.412	.401	.540	...	...	.849	...	...
1922	.438	.428	.546	...	...	...	...	...
1923	.431	.407	.681	.726	...	...	...	...
1924	.431	.405	.791	.304	...	...	...	...
1925	.429	.397	.714	.358	...	...	...	...
1926	.404	.360	.720	.227	...	...	...	...
1927	.378	.374	.617	.249	...	...	...	...
1928	.373	.308	.588	.194	...	...	...	...
1929	.407	.326	.624	.349	...	.169	...	...
1930	.434	.336	.660	.334	.201	2.750	...	...
1931	.410	.311	.622	.340	.197	.442	...	...
1932	.412	.309	.648	.223	.190	.337	.435	5.250
1933	.377	.307	.561	.537	.118	.256	.447	...
1934	.319	.256	.511	.133	.108	.211	.177	.162
1935	.306	.253	.481	.120	.169	.362	.131	.193

**AVERAGE GRADES OF ORE MINED IN ONTARIO, 1911-1954**  
**ALL ONTARIO MINES AND BY CAMPS**  
(Continued)

Year	All Ontario Mines	Porcupine Camp	Kirkland Lake	Larder Lake	Patricia Portion	Thunder Bay	Matachewan	Sudbury
1936	.299	.253	.459	.146	.198	.370	.132	.218
1937	.298	.260	.441	.132	.244	.397	.111	.205
1938	.294	.263	.427	.166	.258	.350	.114	.273
1939	.281	.256	.409	.168	.245	.335	.120	.299
1940	.269	.252	.407	.176	.228	.324	.112	.298
1941	.255	.241	.391	.183	.237	.295	.113	.171
1942	.253	.233	.414	.184	.298	.331	.098	.175
1943	.255	.238	.418	.173	.299	.323	.088	.173
1944	.247	.230	.379	.153	.292	.330	.084	...
1945	.244	.232	.376	.159	.265	.388	.095	...
1946	.243	.229	.375	.169	.285	.278	.099	...
1947	.248	.239	.402	.170	.279	.267	.104	.186
1948	.241	.229	.380	.170	.279	.274	.097	.241
1949	.235	.233	.369	.169	.271	.153	.088	.211
1950	.238	.240	.339	.179	.298	.209	.089	.234
1951	.237	.242	.334	.183	.284	.216	.074	.267
1952	.247	.253	.315	.200	.303	.214	.089	.241
1953	.249	.242	.317	.209	.348	.197	.086	.246
1954	.249	.244	.299	.214	.364	.161	.097	.256

Source: Ontario Department of Mines, Statistical Branch.



TABLE 10

**PRICE OF GOLD IN CANADA AND THE RATE OF EXCHANGE**  
(in Canadian Dollars)

Year	Gold Price Per Ounce	Value of U.S. Dollar in Canada	Year	Gold Price Per Ounce	Value of U.S. Dollar in Canada
1910	18.93	...	1934	34.56	99.00
1911	19.51	...	1935	35.15	100.51
1912	20.87	...	1936	35.03	100.06
1913	20.64	...	1937	34.98	99.99
1914	20.67	...	1938	35.19	100.56
1915	20.66	...	1939	36.20	103.70
			1940	38.50	110.50
1916	20.67	...			
1917	20.73	...			
1918	20.67	101.66	1941	38.50	110.50
1919	20.58	103.53	1942	38.50	110.50
1920	23.42	112.27	1943	38.50	110.50
			1944	38.50	110.50
1921	22.69	111.61	1945	38.50	110.45
1922	20.88	101.45			
1923	20.94	101.97	1946	36.75	105.75
1924	20.79	101.31	1947	35.00	100.25
1925	20.67	100.03	1948	35.00	100.25
			1949	36.00	103.08
1926	20.67	100.01	1950	38.05	108.92
1927	20.67	100.03			
1928	20.67	100.02	1951	36.85	105.28
1929	20.76	100.76	1952	34.26	97.89
1930	20.69	100.15	1953	34.42	98.34
			1954	34.06	97.32
1931	21.57	104.27			
1932	23.46	113.52			
1933	28.94	108.74			

TABLE 11

**ONTARIO GOLD MINES**  
**COMPOSITION OF VARIABLE COSTS PER TON, 1914-1954**

Year	Wages and Salaries	Materials	Fuel and Electricity	Total Variable Costs
1914	3.07	...	...	...
1915	2.37	...	...	...
1916	2.20	...	...	...
1917	2.61	...	...	...
1918	3.02	...	...	...
1919	2.69	...	...	...
1920	2.66	...	...	...
1921	2.61	...	.07	...
1922	2.63	...	.09	...
1923	3.07	...	.55	...
1924	2.86	...	.43	...
1925	2.86	...	.43	...
1926	2.70	...	.45	...
1927	2.48	...	.45	...
1928	2.61	...	.51	...
1929	2.90	...	.56	...
1930	3.03	...	.56	...
1931	2.81	...	.48	...
1932	2.72	...	.49	...
1933	2.72	...	.49	...
1934	2.75	...	.49	...
1935	2.83	.99	.49	4.31
1936	3.08	1.09	.49	4.66
1937	3.28	1.09	.49	4.86
1938	3.25	1.19	.47	4.91
1939	3.29	1.18	.47	4.94
1940	3.11	1.15	.44	4.70
1941	3.29	1.12	.44	4.85
1942	3.16	.97	.46	4.59
1943	3.31	.99	.51	4.81
1944	3.55	1.07	.56	5.18
1945	3.73	1.18	.50	5.41
1946	3.91	1.28	.49	5.68
1947	4.22	1.48	.49	6.19
1948	4.31	1.47	.44	6.22
1949	3.93	1.45	.41	5.79
1950	3.95	1.42	.42	5.79
1951	4.12	1.57	.43	6.12
1952	4.30	1.60	.43	6.33
1953	4.17	1.58	.43	6.18
1954	4.10	1.58	.40	6.08

Source: Ontario Department of Mines, Statistical Branch.

TABLE 12

**ONTARIO GOLD MINES**  
**PRODUCTIVITY AND VARIABLE COSTS, 1935-1954**  
(1935 = 100)

Year	Tons Produced Per Wage Earner	Variable Costs of Mining	Average Annual Wage
1935	100.0	100.0	100.0
1936	91.3	108.1	100.4
1937	90.2	112.8	105.8
1938	92.1	113.9	106.4
1939	93.0	114.6	108.8
1940	100.0	109.0	110.0
1941	99.9	112.5	116.4
1942	108.2	106.5	124.5
1943	110.9	111.6	125.6
1944	107.6	120.2	130.0
1945	98.6	125.5	125.4
1946	94.6	131.8	127.5
1947	96.2	143.6	139.7
1948	104.9	144.3	158.4
1949	119.9	134.3	165.3
1950	126.3	134.3	173.2
1951	130.1	142.0	185.9
1952	132.8	146.9	197.8
1953	129.4	143.4	183.0
1954	140.4	141.4	202.9

TABLE 13

**ONTARIO GOLD MINES  
PRODUCTION PER WAGE-EARNER**

Year	Tons Milled	Year	Tons Milled
1920	617	1940	632
1921	568	1941	631
1922	579	1942	684
1923	532	1943	701
1924	593	1944	680
1925	637	1945	623
1926	640	1946	598
1927	719	1947	608
1928	665	1948	663
1929	616	1949	758
1930	553	1950	798
1931	637	1951	822
1932	650	1952	839
1933	671	1953	818
1934	629	1954	886
1935	632		
1936	577		
1937	570		
1938	582		
1939	588		



TABLE 14

## LATERAL DEVELOPMENT ACTIVITY, 1940-1953

Year	Feet per 1,000 Tons Milled	Year	Feet per 1,000 Tons Milled
1940	47.7	1947	32.4
1941	41.8	1948	27.2
1942	33.1	1949	24.9
1943	24.7	1950	25.9
1944	23.9	1951	25.1
1945	27.2	1952	23.2
1946	33.9	1953	20.4

Source: As reported by Ontario gold mines to the Committee.

TABLE 15

# **GOLD AND OTHER MINING IN ONTARIO, 1910-1954** **EMPLOYMENT AND WAGES**

Year	GOLD MINING		OTHER MINING	
	Wage Earners	Average Annual Wage	Wage Earners	Average Annual Wage
1910	319	\$ 805	5,773	\$ 831
1911	585	754	6,188	786
1912	955	1,071	6,480	896
1913	1,520	1,055	7,880	911
1914	1,552	1,196	7,415	894
1915	2,417	913	7,337	849
1916	2,600	1,180	7,838	980
1917	2,561	1,257	6,611	1,365
1918	2,128	1,244	6,505	1,517
1919	2,188	1,394	5,594	1,321
1920	2,040	1,643	6,279	1,613
1921	3,023	1,463	2,842	1,034
1922	3,919	1,349	2,776	1,189
1923	4,241	1,470	4,844	1,280
1924	4,840	1,525	5,807	1,207
1925	5,334	1,642	4,780	1,372
1926	5,778	1,539	4,808	1,630
1927	5,963	1,597	4,888	1,847
1928	6,356	1,562	5,365	1,478
1929	6,437	1,619	7,354	1,541
1930	7,132	1,507	7,855	1,498
1931	7,886	1,618	5,345	1,475
1932	8,460	1,597	2,885	1,438
1933	8,371	1,654	3,904	1,413
1934	10,193	1,562	5,963	1,471
1935	11,132	1,595	7,597	1,501
1936	13,432	1,601	9,552	1,468
1937	14,783	1,687	11,617	1,647
1938	16,478	1,697	11,135	1,676
1939	18,241	1,735	11,717	1,702
1940	18,611	1,755	11,766	1,733
1941	19,362	1,857	12,197	1,882
1942	15,561	1,985	13,553	1,906
1943	11,511	2,004	14,048	1,998
1944	9,996	2,074	15,133	1,871
1945	10,078	2,000	12,613	1,973
1946	12,158	2,034	10,050	2,060
1947	12,637	2,229	12,504	2,329
1948	12,873	2,526	13,777	2,759
1949	13,022	2,636	14,092	2,964
1950	12,898	2,763	15,580	3,009
1951	12,415	2,966	18,785	3,281
1952	11,921	3,155	19,872	3,632
1953	10,565	3,204	20,790	3,856
1954	10,459	3,236	20,101	3,965

TABLE 16

# **ONTARIO GOLD MINES** **WAGE EARNERS BY CAMPS, 1910-1954**

Year	Porcupine	Kirkland Lake	Larder Lake	Patricia	Thunder Bay	Total Ontario
1910	142	15	...	...	...	319
1911	265	67	47	8	60	585
1912	794	...	...	...	85	955
1913	1,112	116	62	...	64	1,520
1914	1,292	124	...	...	...	1,552
1915	2,417	131	...	...	...	2,417
1916	2,309	186	...	...	...	2,600
1917	2,198	218	...	...	80	2,561
1918	1,693	290	56	...	73	2,128
1919	1,932	203	34	...	...	2,188
1920	1,747	217	52	...	...	2,040
1921	2,775	227	...	...	21	3,023
1922	3,429	468	...	...	...	3,919
1923	3,606	502	84	...	13	4,241
1924	4,205	530	105	...	...	4,840
1925	4,419	739	158	...	...	5,334
1926	4,670	927	181	...	...	5,778
1927	4,486	1,243	234	...	...	5,963
1928	4,428	1,633	295	...	...	6,356
1929	4,165	2,068	66	63	27	6,437
1930	4,482	2,389	75	132	...	7,132
1931	4,534	3,010	79	173	...	7,886
1932	4,671	3,224	69	174	123	8,460
1933	4,388	3,309	50	234	156	8,371
1934	5,295	3,456	69	340	508	10,193
1935	5,781	3,543	46	533	528	11,132
1936	6,504	3,999	134	965	883	13,432
1937	7,060	4,423	211	1,056	953	14,783
1938	7,557	4,560	537	1,322	1,450	16,478
1939	7,872	4,671	699	1,850	1,610	18,241
1940	8,511	4,336	758	2,111	1,785	18,611
1941	9,191	4,011	1,028	2,219	1,719	19,362
1942	8,069	2,683	922	1,687	1,332	15,561
1943	6,137	2,272	663	1,150	832	11,511
1944	5,597	2,064	564	937	616	9,996
1945	5,789	2,116	556	886	525	10,078
1946	6,696	2,491	761	1,191	777	12,158
1947	6,543	2,595	922	1,250	889	12,637
1948	6,695	2,610	902	1,433	798	12,873
1949	6,413	2,516	946	1,532	902	13,022
1950	6,596	2,516	946	1,532	902	12,898
1951	6,409	2,557	917	1,448	721	12,415
1952	6,430	2,384	872	1,302	543	11,921
1953	5,523	2,251	839	1,197	437	10,565
1954	5,605	2,158	930	1,176	327	10,459

Source: Ontario Department of Mines, Statistical Branch.

TABLE 17

## ONTARIO GOLD MINES PRODUCTION 1954

	Tons Milled	Gold Ounces	Silver Ounces	Total Value*
<b>PORCUPINE</b>				
Aunor	167,388	62,361	4,531	\$2,129,559
Bonwhit	61,716	20,860	....	710,561
Broulan Reef	90,991	16,684	2,951	566,908
Coniaurum	118,180	28,160	4,981	964,329
Delnite	144,504	38,052	2,864	1,299,541
Dome	697,600	171,399	34,604	5,867,430
Hallnor	119,630	43,410	5,355	1,484,159
Hollinger	1,067,954	303,638	52,103	10,390,800
Hugh-Pam	61,562	10,543	....	359,114
McIntyre	750,570	203,554	41,050	6,967,855
Pamour	637,012	55,865	5,054	1,906,533
Paymaster	30,726	5,705	1,130	194,206
Preston East Dome	211,112	58,186	6,754	1,989,093
Ross	112,751	20,409	41,293	729,382
TOTAL	4,271,696	1,038,919	202,689	\$35,562,655
<b>KIRKLAND LAKE</b>				
Kirkland Lake Gold	117,137	39,572	3,489	1,351,081
Lake Shore	252,455	85,212	28,279	2,926,613
Macassa	145,286	50,358	6,948	1,720,376
Sylvanite	171,572	53,717	10,649	1,838,532
Teck-Hughes	237,174	37,529	6,779	1,284,038
Upper Canada	196,978	46,987	21,436	1,618,681
Wright-Hargreaves	193,900	79,403	13,501	2,715,625
TOTAL	1,314,502	392,788	91,081	\$13,455,219
<b>LARDER LAKE</b>				
Kerr-Addison	1,658,293	363,139	20,119	\$12,408,281
<b>MATACHEWAN</b>				
Young-Davidson	312,791	30,671	9,921	\$ 1,052,615
<b>SUDBURY</b>				
Renabie	167,257	42,728	13,020	\$ 1,466,441
<b>PATRICIA PORTION</b>				
Campbell Red Lake	227,804	101,270	7,159	3,454,986
Cochenour Willans	96,286	24,769	910	844,867
Madsen Red Lake	286,246	82,344	17,165	2,818,318
McKenzie Red Lake	84,260	17,321	8,296	596,759
New Dickenson	131,422	63,531	4,487	2,167,064
Pickle Crow	112,282	46,705	6,010	1,594,454
Starratt Olsen	98,898	14,636	2,379	500,888
TOTAL	1,037,198	350,577	46,406	\$11,977,336
<b>THUNDER BAY</b>				
Leitch	51,632	33,608	1,082	1,145,304
MacLeod-Cockshutt	556,525	61,397	6,624	2,095,929
TOTAL	608,157	96,365	7,726	\$ 3,287,356
<b>MISCELLANEOUS</b>				
....	....	24	....	816
Total Ontario Gold Mines †	9,369,894	2,315,213	390,962	\$79,210,802

Source: Ontario Department of Mines, Statistical Branch

\*Total Value includes value of silver production, worth \$323,710 in 1954.

†Does not include gold production from mines other than gold. In 1954, this amounted to \$1,573,159.











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